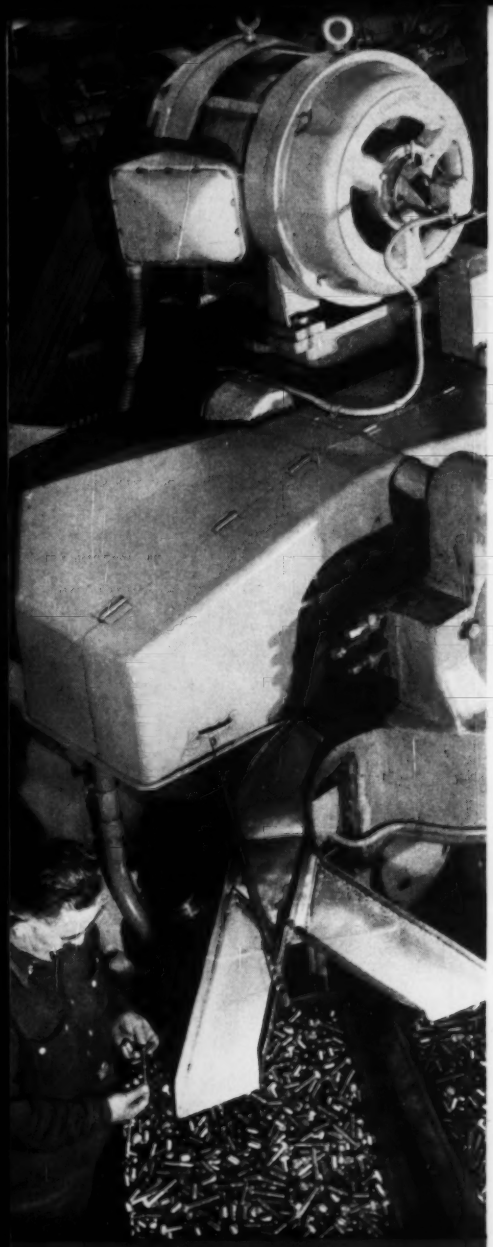


JANUARY 12, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Page 35 . . .

Steel Capacity: 147.6 Millon Tons

Page 42 . . .

'Lunik' To Spur U. S. Spending?

Page 70 . . .

Continuously Cast Thin Strip Is Shortcut to Aluminum Extrusions

Page 74 . . .

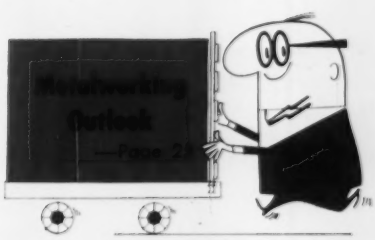
How Color Coat Brightens Zinc

Page 84 . . .

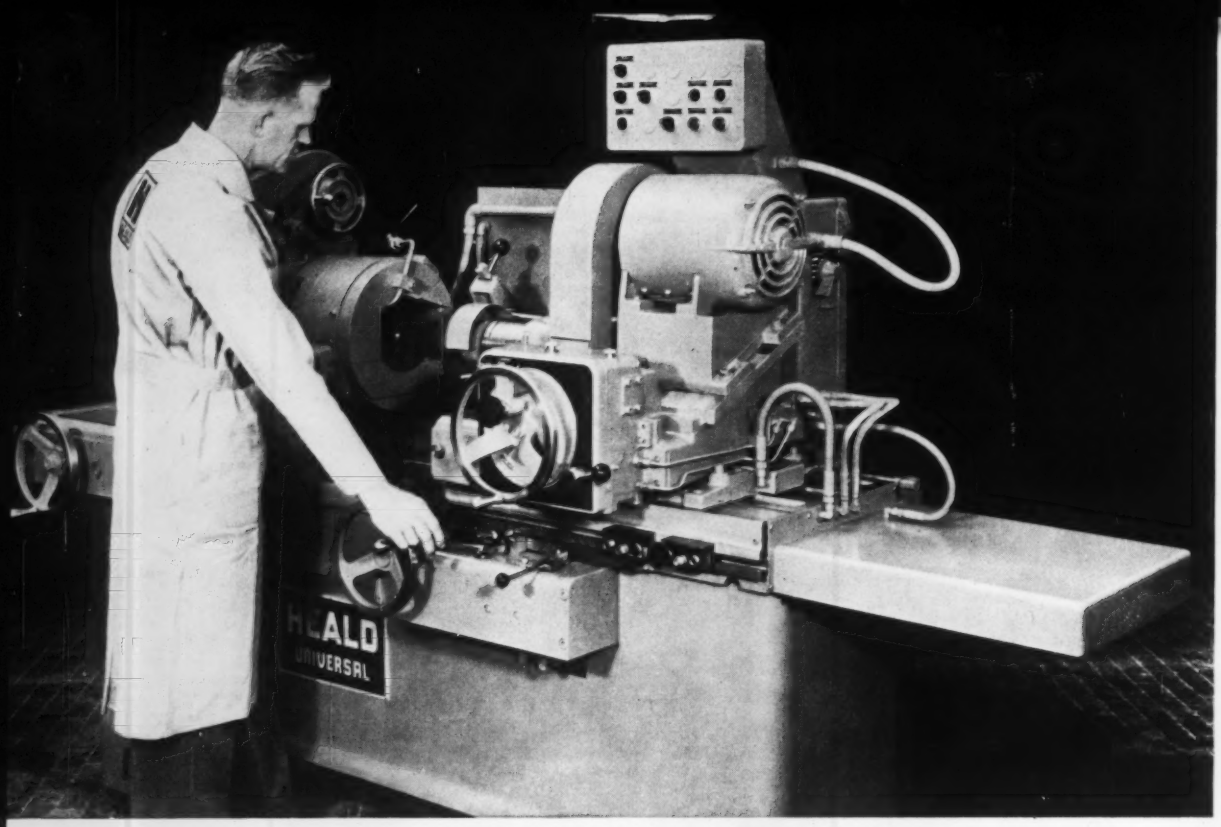
New Alloy Stands Heat, Corrosion

Page 92 . . .

Pig Iron Upturn Gains Momentum



CONTENTS — PAGE 5

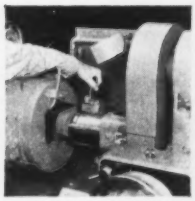


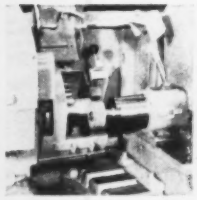
Presenting the Heald Model 273-A NEW UNIVERSAL

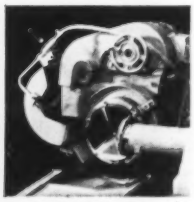
a completely new machine with

1959 PERFORMANCE

and a 1947 PRICE TAG







. . . for I. D., O. D. and Rotary Surface Grinding

THIS is the machine that "couldn't be built" — a better, more *versatile* general purpose grinder that costs about *half* as much as comparable machines today, and *less* than similar machines (with fewer features) cost in 1947!

Here are just a few of its outstanding features:

Hydraulic Anti-Friction Ways — table and cross slide are supported on "pockets" of pressurized oil. A quarter-pound force moves the 1800-pound table.

20-Inch Table Travel — more than in any previous standard base Heald universal grinder.

Workhead Swivels 90 Degrees — permitting rotary surface grinding as well as I.D. and O.D. grinding.

Three Wheelhead Positions — standard, 2" forward or 7½" forward for greater grinding versatility.

Vari-speed Workhead Drive — infinitely variable from 150 to 450 rpm.

Swing Inside Standard Guard — 12".

Standard O.D. Grinding Capacity — 12".

Accuracy — holds tolerances within .0001" in routine production and within .000050" in special cases.

Ask your Heald engineer for the complete UNIVERSAL story. Then compare its performance and cost with *any other machine* available today. And if you have a Heald toolroom grinder that's 10 to 30 years old, you can now replace it profitably — at a cost that's *too low* to pass up.

HEALD®

It PAYS to come to Heald

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

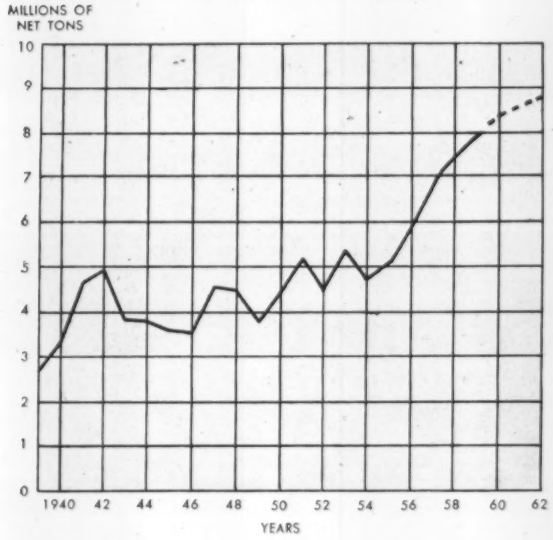
Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

MORE structural steel is available- now and in the years to come

In 1959 builders of highways, bridges and buildings will have available more steel than ever before. The steel industry (and Bethlehem Steel in particular) has expanded facilities for producing structural shapes so that there *is* steel for the job.

RISE IN STEEL INDUSTRY'S PRODUCTION OF HEAVY STRUCTURAL SHAPES



We estimate the industry will be able to turn out 8 million tons of structural steel in 1959. What's more, it is estimated that anticipated expansion will bring the industry's capacity up to 9 million tons annually by the mid 1960's.

BETHLEHEM INCREASES CAPACITY

Since our Bethlehem, Pa., plant is the largest single unit producing structural shapes in the country, its role is a most important one.

In 1955, for example, we were caught in a squeeze. We had foreseen the increased demand and had already started a huge expansion program a year earlier. Expansion on such a major scale required the shutting down of some facilities, and just at that critical period, the boom hit. So while we were in the midst of trying to relieve the shortage of the future, we were temporarily unable to turn out as much as before.

But it all paid off. Today Bethlehem is able to turn out over 3 million tons of shapes each year, or about 40 per cent of the entire industry's total.

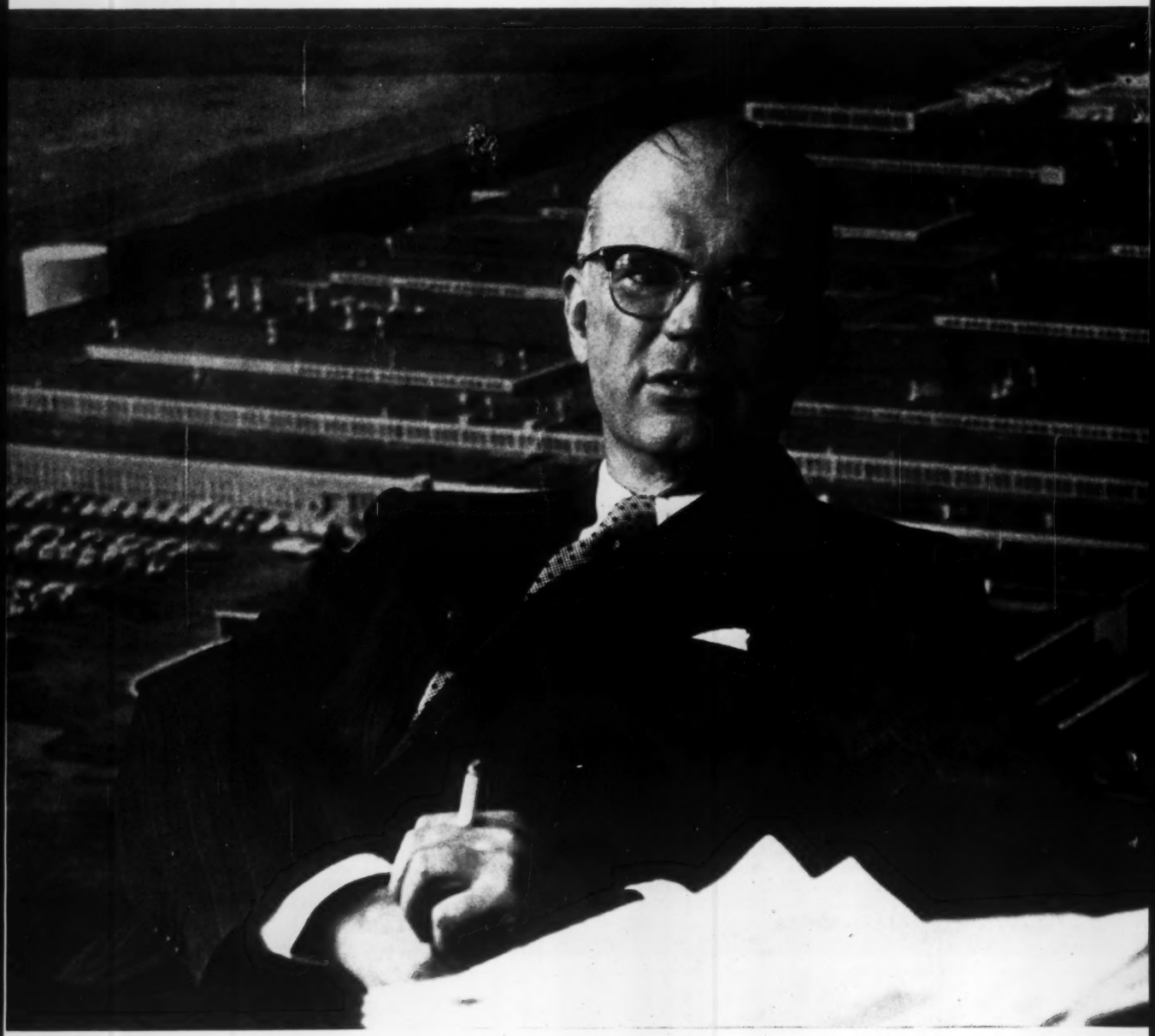
Structural steel *is* available. You can plan and design in structural steel with complete assurance, both now and in the years to come.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

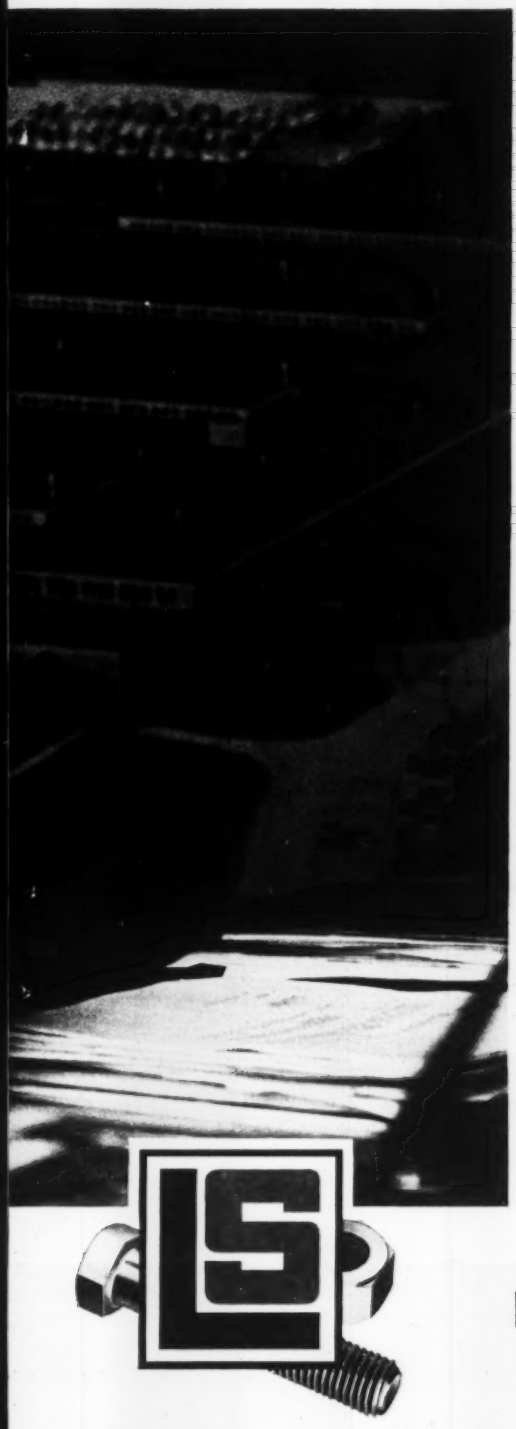
BETHLEHEM STEEL

BETHLEHEM STEEL

GEORGE S. CASE, Jr., *President,*



Lamson & Sessions, tells...



How we've planned our organization to help you "tighten up" on fastening costs

TOO OFTEN, unit price has been the sole criterion in fastener buying. Actually, what you want to buy and what we have to sell is *lower total cost* of assembly.

The past twelve months have seen the culmination of a carefully planned, long-term program at The Lamson & Sessions Co. Included in this program are:

Two new, ultra-modern plants at Cleveland and Chicago—plus up-to-date plants at Birmingham, Kent and Cuyahoga Falls, Ohio—representing an investment of more than $18,000,000 in fully-integrated, high volume, high precision production facilities.

A new concept of customer service through effective co-ordination of all departments—Sales and Order Service, Research and Development, Engineering, Quality Control, Purchasing, Inventory Control, Packaging and Shipping.

Today, as industry moves more and more toward automated or semi-automated production and assembly, highest quality and reliability of components becomes a *must.* Our entire effort is organized to assist you in attaining this goal—where *any* type of standard or special fastener is required.

In future messages, we'll tell you about specific ways in which—

L & S Fastener Engineering helps you "tighten up" on . . .

- **PURCHASING COSTS**
- **INSPECTION AND HANDLING COSTS**
- **ASSEMBLY COSTS**

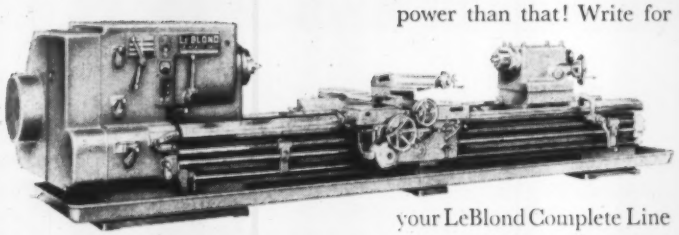
LAMSON & SESSIONS

5000 TIEDEMAN ROAD • CLEVELAND, OHIO

Plants in Cleveland and Kent, Ohio • Chicago and Birmingham

THE POWERFULEST LATHES IN EVERY CLASS YOU'LL FIND IN THE LINE OF LeBLOND

This is the 32″ Heavy Duty —pride of the LeBlond Line. Able to push ceramics and carbides to their limits. 36 speeds at 60 HP—and engineered from power unit to cutting tool for far more power than that! Write for your LeBlond Complete Line Catalog No. **C-58G.**



THE R. K. LeBLOND MACHINE TOOL CO. CINCINNATI 8, OHIO

World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

This Week in STEEL Metalworking Weekly

January 12, 1959
Vol. 144 No. 2

EDITORIAL 31

Monopoly power of unions must be fought with facts, legislation, resistance to unwarranted demands.

SPECIAL FEATURE 33

Makers of components may not be jumping with joy for a while, but the smiles that replaced frowns on their faces in the fourth quarter of 1958 are still there. Reason: The upturn in new orders which began near the end of the old year is continuing and shipments are beginning to increase.

WINDOWS OF WASHINGTON 42

As result of Russians' "Mechta," Congress at this session may add funds to existing space programs.

MIRRORS OF MOTORDOM 51

Consultant designs car smaller than today's Detroit offerings, but just as roomy. Engine: Aluminum V-8.

THE BUSINESS TREND 55

Indications are that business will get back to prerecession levels during the next six months.

WHERE TO FIND—

Behind the Scenes 6
Letters to the Editors 10
Editorial & Business Staffs 16
Men of Industry 59
New Products 87
New Literature 89
Advertising Index 115

Business—

METALWORKING OUTLOOK 25

☑ Partmakers See Good First Half—Roundup on components 33
☑ Steel Capacity Soars to New High—Now 147,633,670 tons 35
☑ What European Currency Shakeup Means to Metalmen 36
Major Strikes Up Idleness—A review of the labor situation 37
Metals Help Textile Giant—Diversification routs red ink 38
Can You Use Hafnium?—A roundup on this metal and outlook .. 39
Reactor Backlog Grows—Developments to keep your eye on 40
Railroads Lower Costs with Flash Buttwelding 41
Dear Boss: Letters Will Help Keep Your People Happier 45
Wheeling Steel Will Make Strip—Buys Follansbee facilities 48
Mining Firm Expands—Humboldt doubles productive capacity .. 49

Production—

TECHNICAL OUTLOOK 69

☑ Continuous Casting, Impact Extrusion Spark Revolution in Aluminum Partmaking 70
☑ Inexpensive Chromates Give Zinc Surfaces Color Appeal 74
Plating Aids Soldering—Eliminates corrosive fluxes 76
☑ Progress in Steelmaking—Welsh Mill Rebuilt within 14 Days 78
Cleaning Delicate Parts? Ultrasonics May Be Answer 82
☑ Alloy Stands Up to Heat—It's Armco's new 22-4-9 84
Device Tells on Corrosion—Tests effectiveness of inhibitors 85

Markets—

MARKET OUTLOOK 91

Complete Index to Market News and Prices 91
☑ Pig Iron Upswing Gains Momentum—Shipments will top '58's .. 92
Steelworks Operation Chart and District Ingot Rates 96
Scrap Marking Time in Slow Market 106
Nonferrous Metals—Metalmen See '59 Upswing 110

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

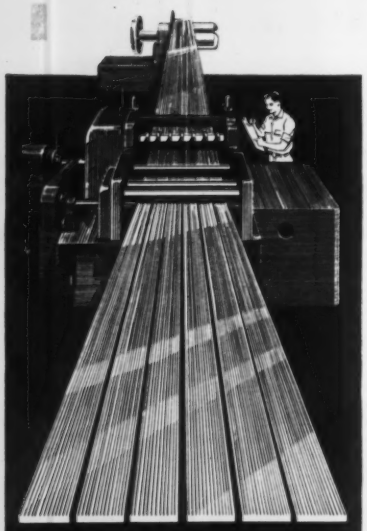
YODER

Rotary Slitters

Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition.

Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Slitter Book.

THE YODER COMPANY
5502 Walworth Ave., Cleveland 2, Ohio



ENGINEERING YODER MANUFACTURING

ROTARY SLITTING LINES
PIPE AND TUBE MILLS
(ferrous or non-ferrous)
COLD ROLL FORMING MACHINES

behind the scenes

Potent Prescription

One day, somebody working at Eli Lilly & Co., Indiana's big pharmaceutical house, noted that a mixture containing sodium ethylmercuri thiosalicylate (thimerosal) and sodium o-phenylphenate (we had to write it out in the interest of accuracy; you don't have to read it aloud) knocked the devil out of (here we go again) pseudomonads.

Pseudomonads are harmful bacteria found in cutting fluids. They cause the stink in used cutting oils. Commonly used germicides had little or no effect on the pseudomonads, and it came to pass in machine shops everywhere that as business increased, so did the stink from the contaminated cutting oils.

Daisy as Sales Aid

The Lilly people named their mixture Elcide 75, which you must admit is a mighty improvement over sodium ethylmercuri, etc. They were familiar with most markets where germicides are sold, but they required a little briefing on the metalworking market. They wrote to STEEL, explained their problem, and received all the marketing information required. Eventually, they purchased advertising space in business publications reaching machine shops. Their ad featured a grimy, rugged machinist sniffing a daisy in the attitude of one who is being sent—and that's the story behind the ad about the bacterial inhibitor that is alleged to keep cutting fluids as fresh as a daisy.

Win $10 Easily

STEEL's continuing series of articles on how to beat the cost crisis is an excellent example of how this publication helps its readers. The stories are helpful because they (a) identify a plant, (b) pinpoint a problem, and (c) explain how the problem was licked. The benefits are obvious.

We are interested in something a little more intangible—and are willing to pay $10 for a letter best describing it. Here's the pitch: You read STEEL because you think you will learn something that will enable you to do your job better. For $10, how about telling us how you are doing a better job because of something you saw in STEEL?

It shouldn't be difficult to explain. Maybe you saw an ad for a wire rope that would serve to fence in widgets, and you told your boss about it, and he bought it, and now you don't have to worry about widgets vibrating out of line. Or, perhaps you read about a new way to stack widdle-waddles, and have converted your plant to the practice. Address your letters to the Readers' Editor, and who knows? Perhaps YOU will win the sawbuck!

Too Late To Classify

A few days before Christmas, Penton Press Manager Carl Schafer, who presides over the nether domains of the Penton Publishing Co., publishers of STEEL, was taken aback, as the saying goes—and we think it's about time it went, too. Carl purchased a rotary type lawn mower away back in the merry month of May, partly because it was the kind he wanted, and partly because the manufacturers had promised him an extra blade. It's a long, long time from May to September, yet Carl screamed all that time—screamed for his extra blade. September, November, December (we have an uneasy feeling that we just got a communication from Walter Huston) and still no blade. As the earth tilted inexorably toward its solstice, Carl gave up, and concentrated on the production of STEEL's 1959 Metalworking Yearbook.

Late one awful afternoon as northern Ohio lay buried under a howling blizzard, the mailman struggled into Carl's office and handed him a package containing one rotary lawn mower blade.

"Splendid!" shouted Mr. Schafer. "All I have to do now is shovel about three feet of snow from my lawn so I can cut the grass. The only catch is, if this storm doesn't stop, I might not even get home!"

Early Hot Stove League

At a conference between the board of directors of the San Francisco Giants, the architect, and consulting engineers, the engineer was questioned about the various equipment he had laid out and specified for the Giants' new baseball stadium.

He noted that the boilers were made by Cleaver-Brooks Co. of Milwaukee.

Immediately, Horace Stoneham, president of the Giants, wanted to know if boilers couldn't be obtained from some place other than Milwaukee.

The whole matter was resolved—and the order closed—when the sales agent was requested to furnish an affidavit to the effect that the Giants will finish ahead of the Braves in the 1959 pennant race.

Count Down

Dear Pentagon: It was announced recently that the U. S. now has the ability and equipment to shoot a man into space. This is to advise you that under no circumstances will we be available for the honor of being your first candidate.

Respectfully,

Shrdlu

(Metalworking Outlook—Page 25)

Get new-forging performance at 1/3 the cost from ERIE FOUNDRY REBUILDING SERVICE

Here at the Erie Foundry Rebuilding "Hospital", we disassemble and inspect your forging hammer, remachine worn surfaces, true bearings, replace broken parts, repair cracked parts. Once the hammer is reassembled, tested and put back in operation, it'll be as spry and sound as a new machine—but at one-third the cost!

Stands to reason that the leaders in forge manufacture for over 60 years should be the best source for forge repair.

Regardless of who made it, or how badly it's cracked, broken or worn, your forging hammer will recover most quickly at Erie Foundry's Rebuilding "Hospital". Write for the complete story.

ERIE

THE WORLD'S GREATEST NAME IN FORGING SINCE 1895

ERIE FOUNDRY CO.
ERIE 2, PA.

EF-59-02

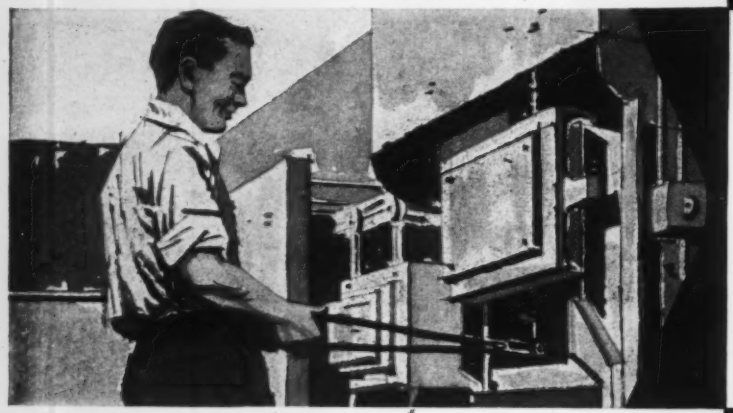
Make profit moves NOW
TO COMPETE AT A PROFIT

The future is great in a growing America.

And now is the time to get ready to cash in big. Make those profit moves that will pay off in increased efficiency, higher productivity, lower costs, bigger sales, bigger profit.

Why now? Machinery, equipment, tools, materials, and manpower are more readily available—at better costs—than they will be in the foreseeable future. Quality is high. Financing is favorable. It's safe to predict that by acting NOW, you'll get most for your money.

This way, you won't simply be *competitive* when the big rush starts. You'll be COMPETITION . . . the big competition in your line.



3-way analysis . . .
EXAMINATION, DIAGNOSIS, PRESCRIPTION

from 3 angles . . .
EFFICIENCY, SUITABILITY, COST

gains 3 benefits . . .
QUALITY, OUTPUT, ECONOMY

when you use Republic 3-Dimension Metallurgical Service

A good starting point is to take advantage of Republic's famed 3-Dimension Metallurgical Service. First, the Republic Field Metallurgist discusses problems of steel selection and production with your metallurgical and manufacturing people. His findings are supplemented by the other two members of the Republic team—the Laboratory and Mill Metallurgists. Their combined recommendations, best suited to your plant and particular problems, are passed on to your personnel. The direct result is the right steel in the right place. The direct benefit is often a better product, faster production, and lower costs.

Make your first profit move NOW. Use Republic's 3-Dimension

METALLURGICAL TEAMWORK PRODUCED THESE COMPETITIVE ADVANTAGES

Metallurgists of Bendix Products Division, Bendix Aviation Corporation, undertook a program to improve processing deficiencies of steels used for aircraft landing gear. Republic was consulted and the program outlined. Republic's 3-D Metallurgical Service Team went into action. The field metallurgist worked closely with Bendix personnel right in their own plant under actual operating conditions. Findings were supplemented and co-ordinated by two other members of the Republic team — the laboratory and mill metallurgists. The result: development of a new grade of steel, ideal for landing gear application to withstand shock, impact, strain, and vibration.

On the advice of a Republic Pig Iron Metallurgist, Atlantic Foundry Company, Akron, Ohio, switched to Republic Chateaugay Pig Iron as the base metal for ram and cylinder castings used in hydraulic presses. *The result:* stronger castings, higher wear-resistance, better machinability, and the decided competitive advantage of passing along a 21% saving to customers. Atlantic's Vice President of Iron Foundry Operations says, "Another thing we like about Republic, aside from the year-in, year-out uniform chemistry of Chateaugay, is the Field Engineering Service you give. When we have a foundry problem and put in a call for help, your metallurgical engineers are Johnny-on-the-spot, talking a language we can understand. Then it's not long before the problem is solved."

At the suggestion of Republic's Steel and Tubes Division, American Machine and Foundry Company is saving $34,000 in manufacturing the famous AMF pinspotter. They had been using steel tubing that required a boring operation on each end and centerless grinding on the O.D. Because Republic ELECTRUNITE® Mechanical Tubing easily met tolerance requirements, AMF was able to eliminate boring and grinding operations. This meant an immediate $15,000 savings in fabricating. Another $19,000 was saved on the cost of ELECTRUNITE compared with the tubing previously used. In uniformity, in quality, in fabricating, and in original cost ELECTRUNITE Mechanical Tubing could save you money, too. Call your Republic representative, or send coupon.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

Metallurgical Service

REPUBLIC STEEL CORPORATION
DEPT. ST-6391
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Send more information:

- ☐ 3-D Metallurgical Service Booklet Adv. 1009.
- ☐ Alloy Steels ☐ Pig Iron
- ☐ ELECTRUNITE Tubing

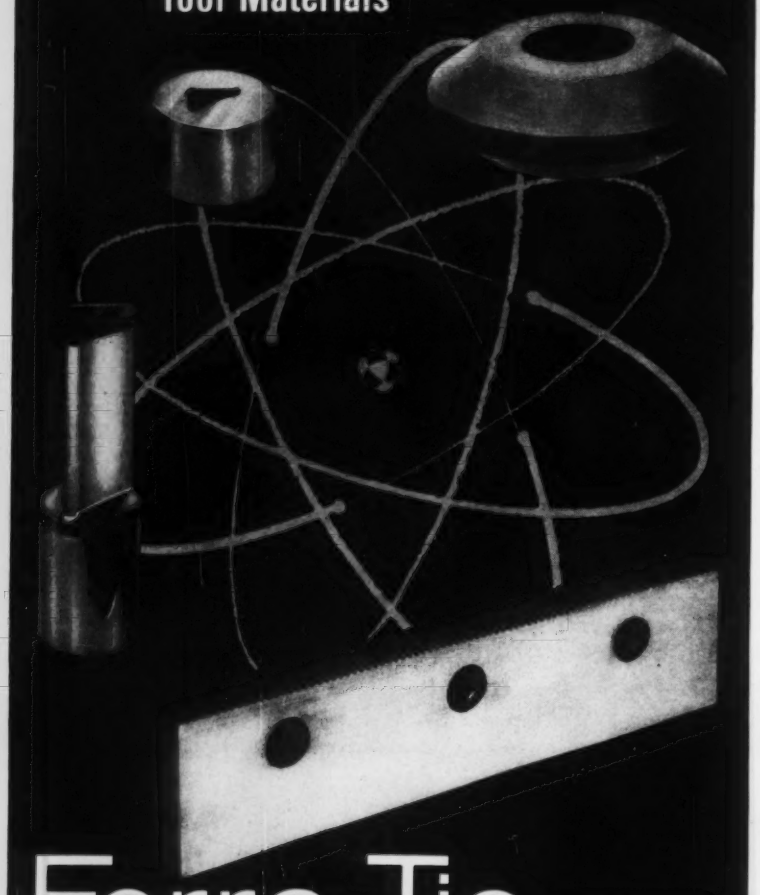
Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

A completely new concept in Tool Materials



Ferro-Tic (with proven performance)

the only machinable carbide in existence!

FOR: Blanking, Laminating, Deep Drawing and Heading Dies, Arbors, Core Rods, Wear Parts, etc.

FERRO-TIC combines the fabricating advantages of steel with the wear-resistance of carbide. In the annealed, completely dense state, FERRO-TIC can be machined with high-speed steel tools on conventional tool room equipment; thus, the need for costly diamond grinding is eliminated. Once hardened, by oil quenching from 1750°F, FERRO-TIC is extremely hard and wear-resistant. FERRO-TIC stock blanks can be fabricated into long-wearing carbide components, using available tools and skills without delay!

AGENTS THROUGHOUT THE U.S.A.

Write or telephone for complete information:

FERRO-TIC can be
- **TURNED**
- **DRILLED**
- **MILLED**
- **SAWED**
- **TAPPED**

SINTERCAST
CORPORATION OF AMERICA
136 Woodworth Avenue, Yonkers 2, N.Y. YOnkers 9-6767

LETTERS
TO THE EDITORS

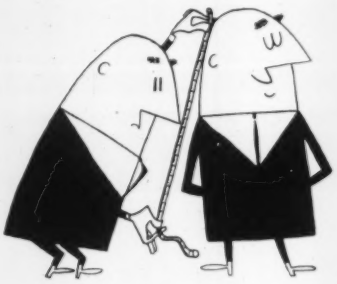
Revises Capacity Figures

We would like to correct the reference to Carpenter Steel Co. in your interesting article, "Vacuum Melting Gains" (Dec. 1, 1958, p. 103).

We find we have erred on the conservative side in the figures we originally submitted to you for use in the "Who's Who in Vacuum Melting" table appearing with the article. The annual capacity of our induction vacuum melting unit is 1,900,000 lb per year rather than 600,000 lb, and the capacity of our consumable electrode unit is 10,500,000 lb per year rather than 8,000,000 lb.

J. W. Thompson
Manager
Sales Development
Carpenter Steel Co.
Reading, Pa.

Wants Gage of Executive Ability



I read "Here's a Way To Measure Executive Ability" (Dec. 15, 1958, p. 86) with a great deal of interest. If you still have a copy of this article available, I would appreciate receiving it.

B. C. Steiner
Division Accountant
and Office Manager
Barberton Div.
Rockwell Mfg. Co.
Barberton, Ohio

• • •

Will you send an extra copy of this interesting article?

Karl G. Nowak
Factory Superintendent
Fenwal Inc.
Ashland, Mass.

Reader Commends STEEL's Job

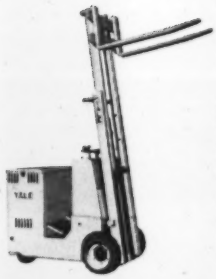
While reading the Dec. 1, 1958, issue of STEEL, I found two articles of extreme interest. I would appreciate receiving a copy of "Purchasing Directors Keep the Machines Running" (p. 48) and a copy of "Breakeven Point: Route to Better Decision Making" (p. 40).

My staff and I find your publication interesting and informative. We feel that

(Please turn to Page 12)

A YALE PRODUCT FOR THE METALWORKING INDUSTRY

ONE YALE TRUCK DOES THREE JOBS ECONOMICALLY



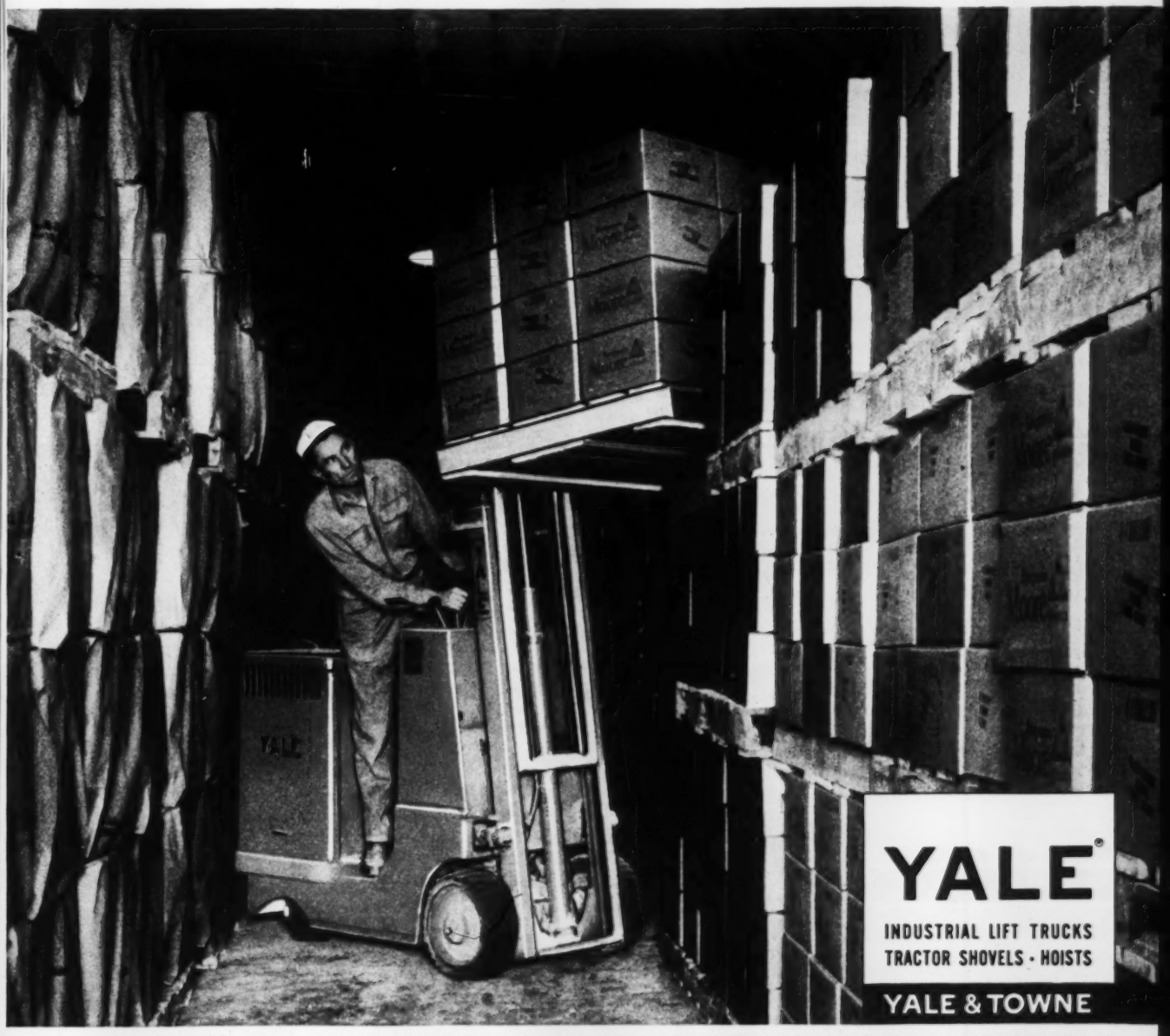
K-46 equally efficient in warehousing, on loading ramp, for mounting and dismounting operations

If your requirements call for a one-truck fleet, the versatile Yale K-46 is the truck for you!

Three features give this economical Yale truck an extraordinary degree of usefulness. *Compactness* makes it a good narrow-aisle truck. *Maneuverability* makes it the perfect truck for loading and unloading on the delivery ramp. *Standup cockpit* permits easy, fast mounting and dismounting... gives the driver a clearer view for loading operations and aisle movement.

The K-46 is the ideal truck for profitable short cycle operations. Compact as it is, this economical truck has *all* the features of the large Yale electric trucks. Exclusive Magnetic Cam-O-Tactor for controlled acceleration and smooth travel—rugged durability—low-cost operation—dead-man control and other safety features. Capacities, 2,000 and 3,000 lbs.

For information about this stand-up electric truck, a cost-cutter in Yale's line of electric trucks (capacities 1,000 to 200,000 lbs.), call your Yale representative, or write for brochure #5112. The Yale & Towne Manufacturing Co., Yale Materials Handling Division, Philadelphia 15, Pennsylvania, Dept. KT 1-V.



YALE®

INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS · HOISTS

YALE & TOWNE

Yale Materials Handling Division, a division of The Yale & Towne Manufacturing Company. **Manufacturing Plants:** Philadelphia, Pa., San Leandro, Calif., Forrest City, Ark. **Products:** Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Industrial Tractor Shovels • Hand, Air and Electric Hoists

124-year-young foundry uses newest PAYLOADER®

The Taylor & Fenn Co. of Windsor, Conn., although one of the oldest foundries in the United States, is also one of the most progressive. For example, 12 years ago they bought one of the first "PAYLOADER" tractor-shovels — at that time a new idea in flexible, low-cost sand handling.

Recently they bought a Model H-25 "PAYLOADER" — the last word in tractor-shovel design and productivity. This modern machine has a carry capacity of 2,500 lbs. — the highest capacity-to-weight ratio ever attained in tractor-shovel design — yet accomplished without any increase in turning radius. In fact, it is even more maneuverable and faster and easier operating because of power-steering and power-shift transmission with 2-speeds both forward and reverse.

Other outstanding features of the H-25 that will benefit The Taylor & Fenn Co. and *all* users of this new "PAYLOADER" model are power-transfer differential, more powerful hydraulic bucket control and the fullest system of air and oil filters and grease seals for long-life protection and low maintenance.

Your "PAYLOADER" Distributor will be glad to show you why a model H-25 will give you more for your money. Ask him about Hough Purchase and Lease Plans too.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
876 Sunnyside Ave., Libertyville, Ill.

Send me more data on the model H-25

Name _____ Company _____

Title _____ Street _____

City _____

State _____

1-A-2

LETTERS

(Concluded from Page 10)

you are doing an excellent job, and should be properly commended for it.

Leonard J. Smith
Executive Director
Training Services
Rutherford, N. J.

Japanese Firm Requests Article

We have read with great interest "Construction Tool Slashes Furnace Maintenance Costs" (Dec. 8, 1958, p. 116). May we have two extra copies?

Kaichi Hikami
Chief Engineer
Nippon Kokan K. K.
New York

Seeks More Information

In a Technical Outlook item, "More Direct Reduction" (Dec. 29, 1958, p. 57) you mention a steelmaking method called the Madrigal process. We would like to get more information about this process.

Paul W. Dillon
Chairman of the Board
Northwestern Steel & Wire Co.
Sterling, Ill.

• *Write to Clarence B. Reynolds, International Ore Processing Co., 353 Union Pacific Bldg., 19 West South Temple, Salt Lake City 1, Utah.*

Welcomes Experiences of Others

I read with great interest, "How To Boost Efficiency of Your Direct Labor" (Dec. 22, 1958, p. 31). This is an area in which all managements are interested, and we welcome reading articles of this nature, based on others' experiences. May we have an extra copy of this article?

A. C. Vander Mast
Manager
Methods & Standards
Wabash Div.
Raybestos-Manhattan Inc.
Crawfordsville, Ind.

Attitude Surveys Helpful

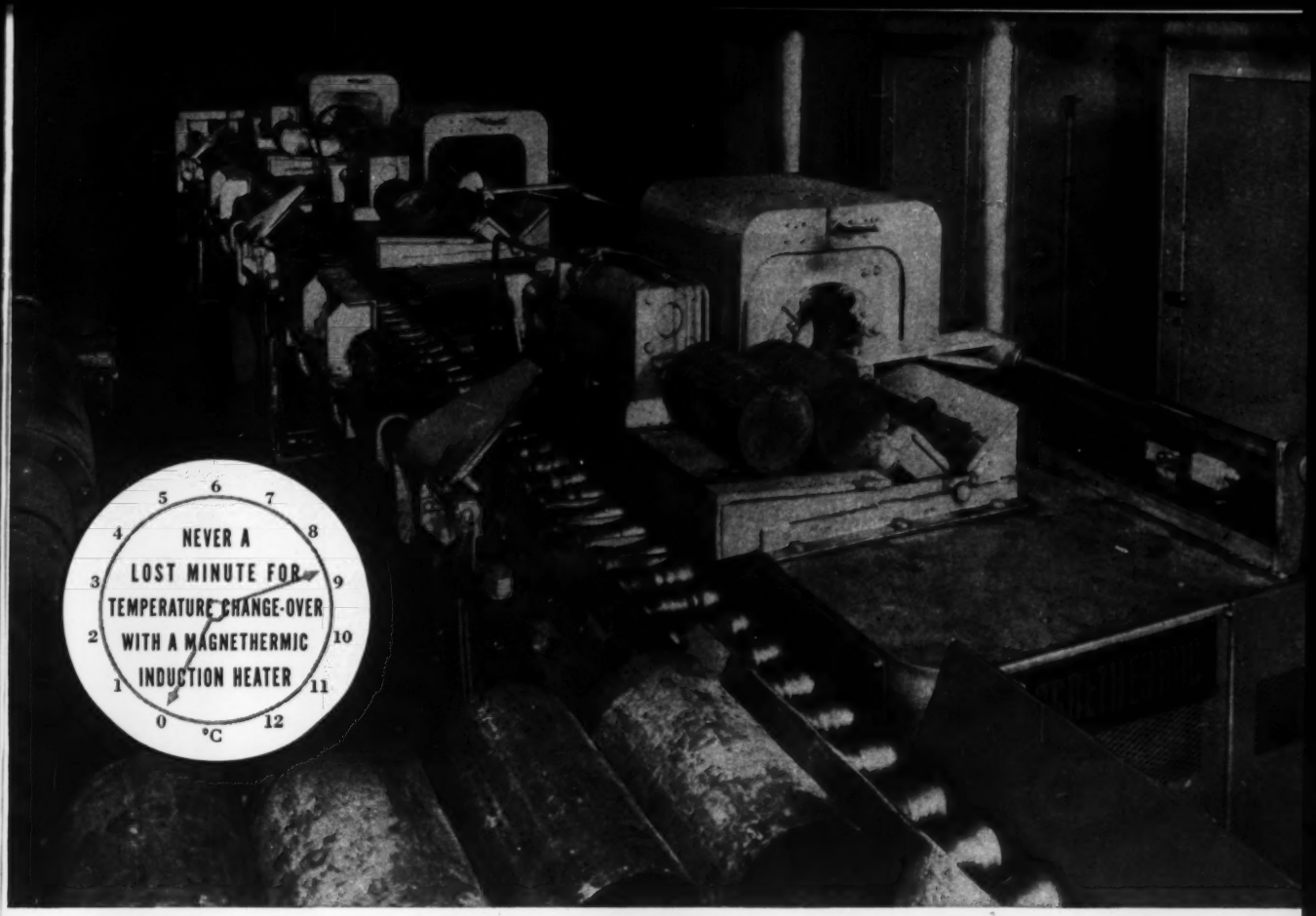
We would like to reproduce "Give Employees Their Say" (Dec. 9, 1957, p. 116). This article has been helpful in our program of informing industry about our inventories.

Willard E. Erickson
Director, Attitude Surveys
University of Chicago
Chicago

Finds Article Pertinent

We would appreciate receiving as many copies as possible of Otto Plagen's article, "You Can Afford To Maintain Numerical Control Equipment" (Dec. 8, 1958, p. 108). We manufacture some of the equipment mentioned, and therefore, find the article quite pertinent.

J. A. Randolph
Sales Manager
General Riveters Inc.
Buffalo



"This installation is Wolverine Tube, Division of Calumet & Hecla, Inc., Detroit, Michigan"

Three Magnethermics, 60 cycle, heating 8" x 15" copper and brass billets for a 3000-ton extrusion press. Each heater is individual of the other, operating from a common loading and unloading conveyor. One, two, or three heaters can be used, depending upon production requirements.

Flexibility for emergency orders - *you never have to plan ahead for a temperature change-over...*

SET THE DIAL — PRESS THE BUTTON — HEATED BILLET

You never have to backlog billets with a Magnethermic Induction Heater. Operator dials the temperature, presses the button, and a uniformly heated billet will be ready in moments. And the next billet and the next will be the same temperature. The Magnethermic heater also records the temperature of each billet so that you have a permanent record for checkback.

When a rush or emergency order upsets the day's schedule, the operator sets the dial to the new temperature and the Magnethermic is ready to deliver immediately. No costly shutdowns normally associated with fuel firing.

More than temperature can be changed over without production delay on a Magnethermic . . . size of billet or type of alloy, as well as temperature, can be adapted in minutes.

This flexibility more than offsets the higher original costs, as many users of Magnethermics have confirmed. Once you have an induction heater, you can forget about the billet heating for your forging presses, extrusion presses or rolling mills. No more stockpiling. No more backlogging. No more long shutdowns.

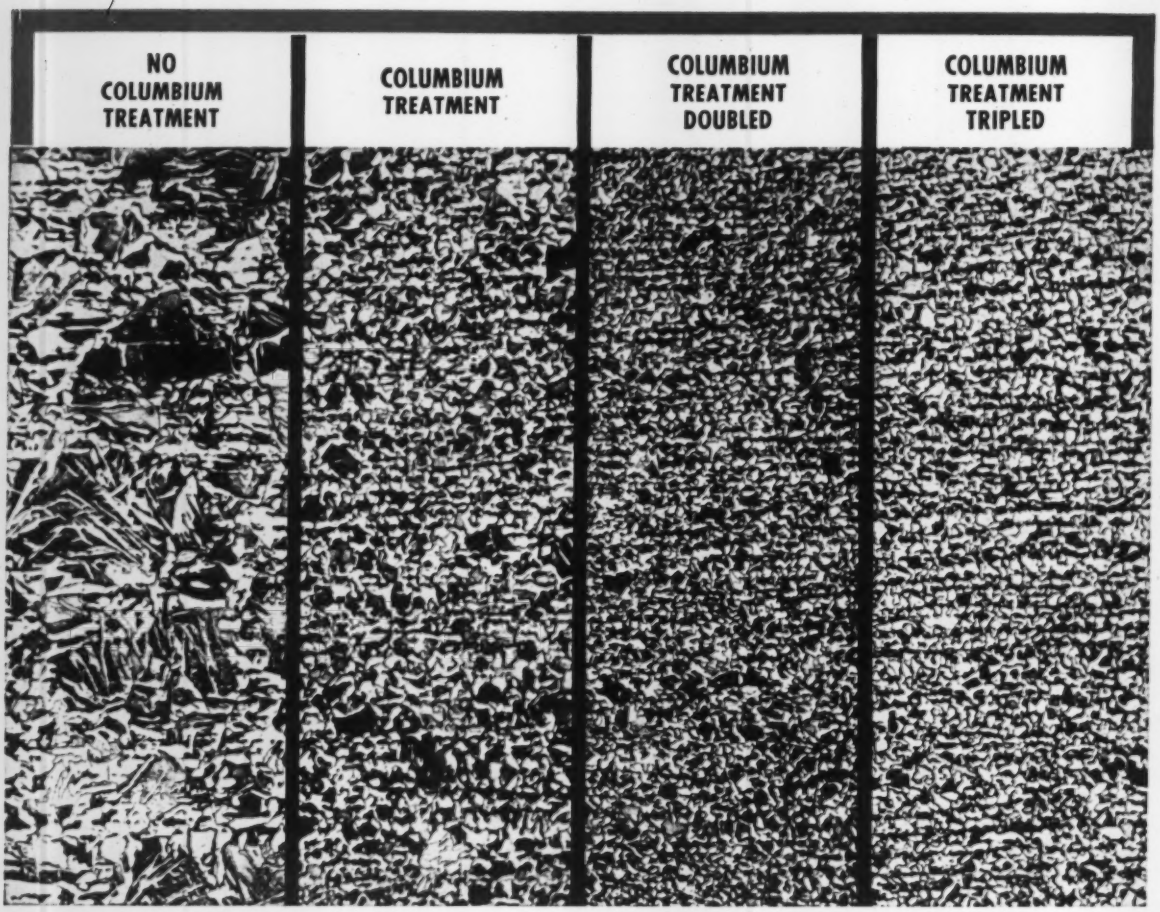
Any metal that can be heated can be heated by a Magnethermic Induction Heater . . . low, dual or high frequency. There are Magnethermics in operation for aluminum, beryllium, copper, columbium, magnesium, molybdenum, nickel and nickel alloys, platinum, carbon and alloy steels, titanium, and vanadium.

Your Inquiry...

Any information on costs or procedure will be promptly sent in response to your request.

MAGNETHERMIC®
CORPORATION
3990 SIMON RD. • YOUNGSTOWN 7, OHIO

HOW GREAT LAKES



Composite of photomicrographs made from the same heat of mild carbon steel shows the effect of varying columbium treatments on the grain structure of the steel.

The Great Lakes Family of High-Strength Steels

N·A·X FINEGRAIN STEEL

Lets you design superior performance, longer life and less weight into your product. Many diversified applications.

N·A·X HIGH-TENSILE STEEL

Offers all the characteristic features of N-A-X Finegrain, plus greatly enhanced resistance to atmospheric corrosion.

GLX W

A series of fine grained, mild carbon steels. They have unusually high strength, toughness and weldability.

N·A·X N-A-XTRA STEELS

Quenched and tempered steels of excellent weldability and toughness, with yield strengths from 75,000 - 110,000 psi.

N·A·X HIGH MANGANESE STEELS

N-A-X High Manganese and High Manganese Special Killed. These steels give yield strengths up to 50,000 psi.

STEEL CORPORATION'S NEW GLX-W STEELS GIVE ... HIGH STRENGTH TOUGHNESS REDUCED COSTS

Key to the success of Great Lakes' new GLX-W Series of steels is the fine grained internal structure produced by treatment with columbium. This grain refinement also contributes to ductility. And in addition, the GLX-W Series' low carbon and manganese content assures excellent weldability with freedom from underbead cracking under all conditions.

COST AND WEIGHT SAVINGS

Where design permits the replacement of carbon steel with GLX-W steels, weight savings of 20 to 35 per cent, and cost savings of 10 to 25 per cent can be realized. When replacing alloy steels the cost savings can range from 25 to 35 per cent. These steels feature higher yield strengths, greater tensile strengths and increased toughness without costly heat treatments or extensive alloy additions.

The GLX-W Series is so priced that substantial cost reductions can be obtained by weight reduction over mild carbon steel. Cost reduction can also be obtained over alloy steels because of the lower price of GLX-W steels.

STRONGER AND TOUGHER

GLX-W steels are stronger and tougher than ordinary mild carbon steels and in some applications can do the job now being done by the more costly alloy steels.

MANY USES FOR GLX-W STEELS

GLX-W steels are especially recommended for a broad range of applications in mobile equipment and pressure vessels, as well as the transportation and construction fields.

GLX
W

For additional technical information about these economical GLX-W steels write

Product Development Division, Dept. B-1

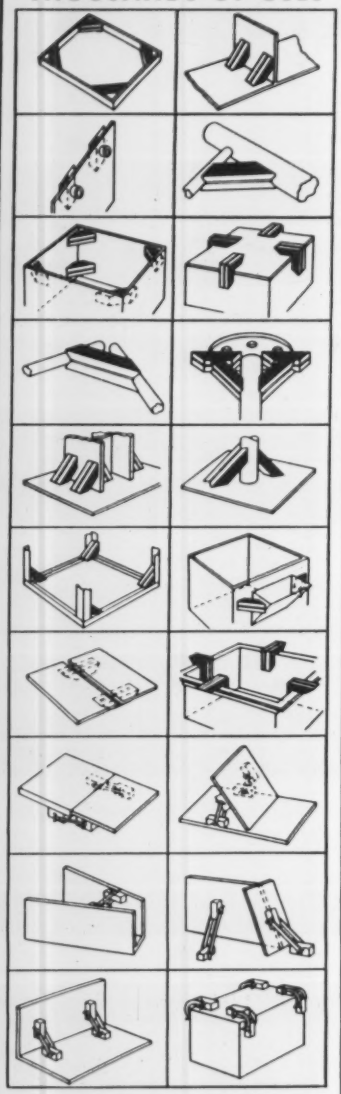
GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

Aronson TWINNER
MAGNETIC CLAMPS

WELDING AIDS WITH
THOUSANDS OF USES



UNIVERSAL BALANCE® POSITIONERS
BENCH TURNTABLE POSITIONERS
GEAR DRIVEN POSITIONERS
HEADSTOCK - TAILSTOCK POSITIONERS
TRACTRED® TURNING ROLLS
TURNTABLES
FULLY AUTOMATIC POSITIONERS

ARONSON
MACHINE COMPANY
ARCADE, N. Y., U.S.A.

WORK WORK

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH....Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
ROBERT M. LOVE .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
GEORGE J. HOWICK .....Assistant Editor
DERRY EYNON .....Assistant Editor
NEIL C. ROBERTS .....Assistant Editor
DONALD E. HAMMERSTROM..Assistant Editor
JOHN TERESKO .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant

JANE WEDGE, Editorial Assistant

THOMAS H. BRYAN, TOM WELSH, Art Editors

IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON, H. GLENN CANARY
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
WILLIAM V. WALLACE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA—Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471..GEO. R. REISS
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Birmingham—Birmingham 3-1121 R. W. KINCEY
St. Louis—Garfield 1-1212. HAMILTON THORNTON
Houston—Hudson 6-5236 .....ROBERT SHIRK
Los Angeles—Webster 5-1234..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 2-1895 .....R. C. HILL
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Paris, France .....LEON JAUDOIN-PROM
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany ....DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Market Research Mgr. ....T. M. BALLANTINE
Circulation Director .....J. C. GERNHARD
Distribution Manager .....G. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Ludlow 6-6988

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
DONALD C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

Clearwater, Fla. .....1954 Jeffords Dr.
H. G. ROWLAND—(Clearwater) 39-9493

Dallas 35 .....818 Exchange Bank Bldg.
JAMES H. CASH—Fleetwood 1-4523

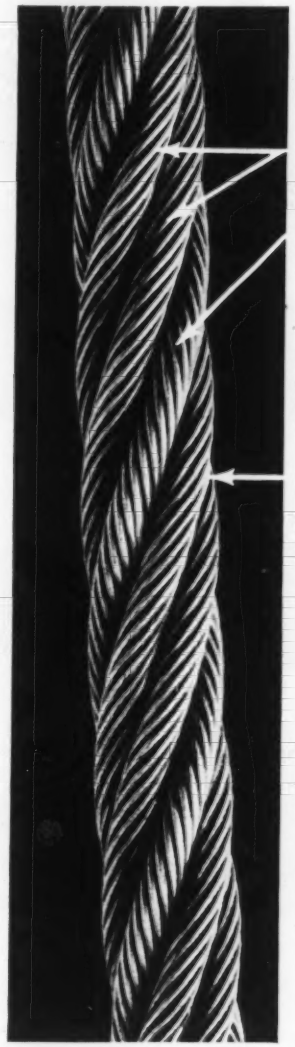
BPA

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....Chairman
RUSSELL C. JAENKE .....President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

NBP

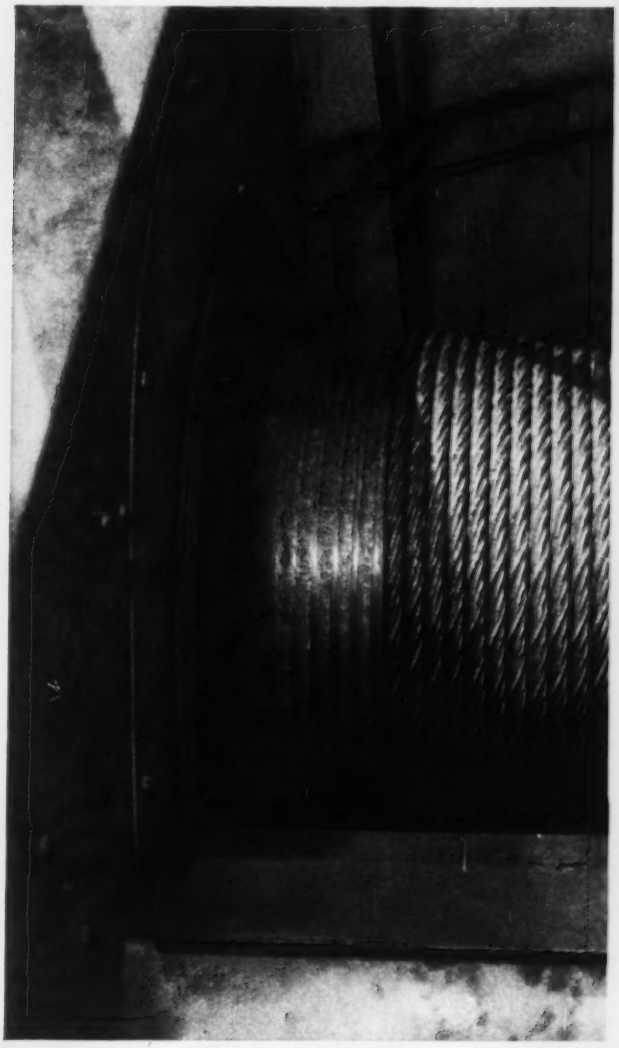
Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristic.

Heavier outside wires in each strand have greater resistance to abrasion.



"... we would never hesitate to recommend it"

GRAY & FEAR, CONTRACTORS

This company continues: "We have been using your Roebling Herringbone* for about one year. We find it is one of the best ropes we have ever used, outlasting previous ropes three to one. It is good that such a reliable rope is available."

This is a direct field quote on the most remarkable development in wire rope in years . . . a new concept in wire rope design. Roebling Herringbone is the regular lay and Lang lay wire rope—two-ropes-in-one rope—combining the best features of both.

Herringbone delivers extra flexibility, extra abrasion resistance, unusual structural stability, extra resistance to shock, easy operation over sheaves and drums and smooth spooling properties.

We recommend Herringbone without reservation for general hoisting and the entire range of heavy-duty equipment. Your Roebling Distributor or Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, will give the full and fabulous details. *Reg. App. For

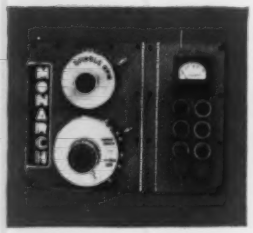
ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
HERRINGBONE
WIRE ROPE

the Monarch gage for

THE HEADSTOCK THAT THINKS... AND REMEMBERS



1. 36 speeds—range 14 to 1750 R.P.M.—ratio 1 to 125. Standard range low enough, high enough and with plenty of speeds in between to provide reasonably constant surface cutting speed on most work.

2. Optional extra-high speed range of 25 to 2500 R.P.M. available for free cutting metals such as aluminum and for ceramic tooling requirements.

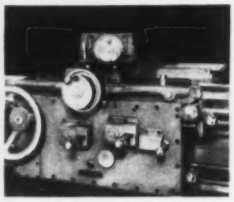
3. Operator works in terms of surface cutting speed. Machine automatically figures correct R.P.M. and sets up shift. Operator sets two large dials—one for work diameter, the other for desired surface speed.

4. Using the two-dial preselector, up to six or more different speed changes may be preset while machine is under cut. This saves speed change time when turning successive diameters having considerable variation or when finish turning immediately follows rough turning. The second dial always indicates spindle speed in engagement.

5. Pull of knob gives free spindle in a jiffy. And there is a generous $2\frac{1}{16}$" hole through the spindle.

6. Hydraulic brake and clutch are self-adjusting for wear. Being under automatic machine control regardless of load, operator need not supply power for engagement.

THE CONTROL CENTER OPERATORS LIKE



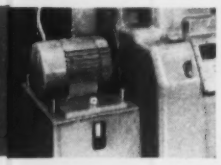
1. Series 62 is controlled by a three-position lever at the apron. A duplicate lever close to the headstock is provided for setup purposes. With it, work rotation may be started or stopped, jogging or speed change may be accomplished. In the SPEED CHANGE position the next speed is engaged automatically when preselection is used.

2. Shifting (an operation performed many times each day) is at finger-touch ease and speed. Hydraulic power does the work of clutching, braking, shifting and jogging.

3. Four-way power rapid traverse is in-built. Both carriage and cross slide traverse may be engaged simultaneously. This saves as much as 50% in tool adjust time.

4. Positive cam controlled feed frictions. Application is such that machine never loses its chip under heavy cuts.

5. Apron or headstock controlled leadscrew reverse, the former a must when much thread chasing is done.



ELECTRICALS WHERE THEY SHOULD BE

1. External main drive motor mounting and external electrical control mounting (either NEMA or JIC) for quick accessibility.

2. Motor mounted on hydraulic system sump from which position it also supplies power for hydraulic pump.

How do your lathes measure up? You get what you pay for in the purchase of a lathe, as with anything else. Greater production, therefore lowered costs, is the major reason for acquiring a new machine. That's what you get in the Monarch Series 62 Dyna-Shift—the only lathe of its general type which can be kept under full load during the entire machining cycle. Major contributing factors design-wise are more machine output per unit of power input, less operator effort, reduced maintenance and ease of supervision. See for yourself why the Series 62 meets all these requirements as does no other lathe on the market.

Users have found that these features and advantages have translated themselves into production increases of 25% or more and tool life improvement up to as much as 50%. And that's the pay-off. When you are ready to invest in a new lathe, buy the best. It's the cheapest in the long run.

THE MONARCH MACHINE TOOL COMPANY
SIDNEY, OHIO

COMPLETE AUTOMATIC LUBRICATION

1. Headstock, end gearing and gear box served by single system of the filtered, combination mist-splash type.

2. Apron lubrication system of the circuited, metered and filtered type also provides oil to carriage guide ways and cross slide bearings.

3. Tailstock has its own lubrication system.

INTERLOCKS FOR SAFETY

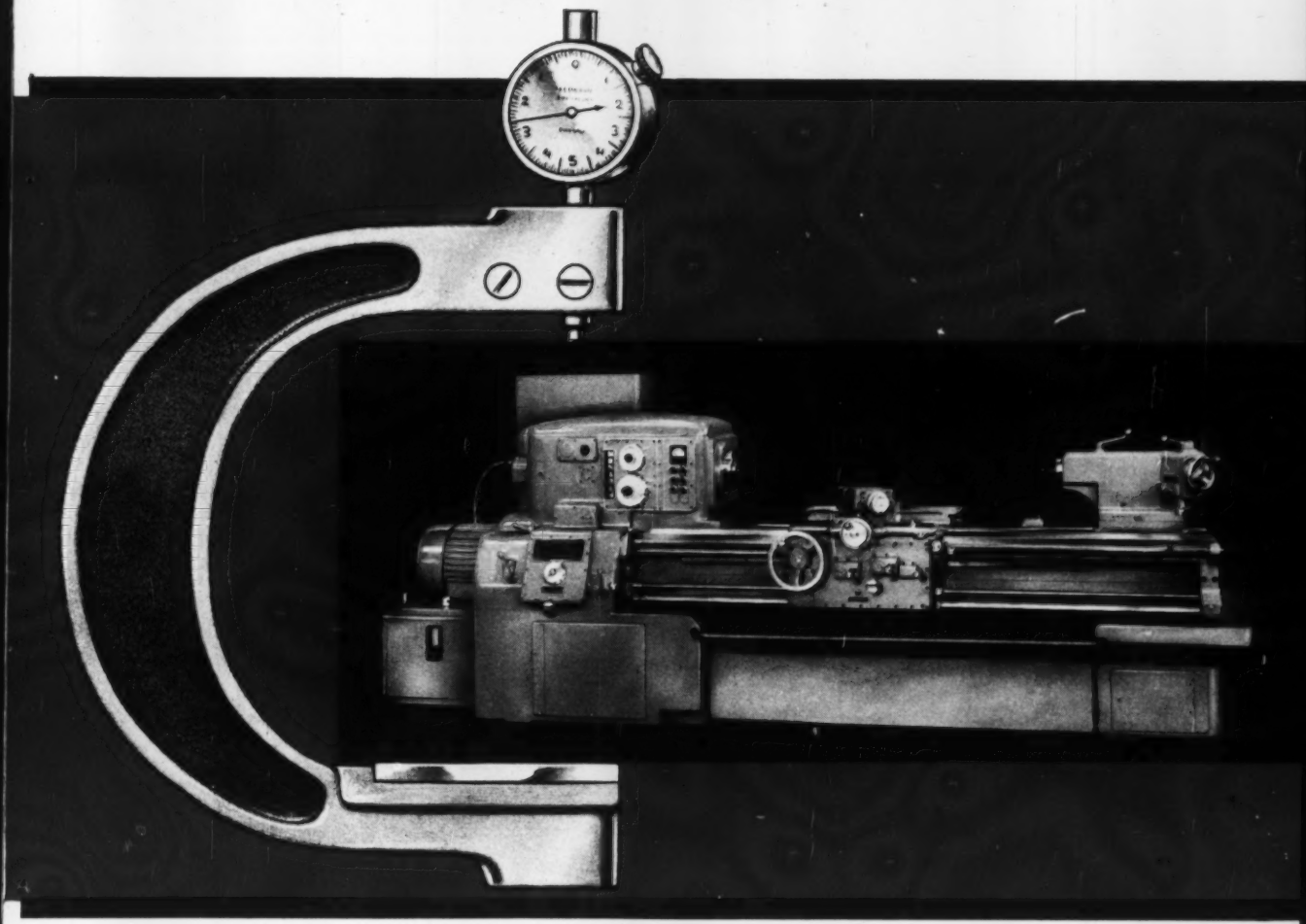
1. When machine is started, the brake engages automatically, preventing spindle rotation regardless of main control lever position.

2. No speed shift can be made with spindle rotating. More than anything else this preserves the original accuracy of headstock gearing.

3. Leadscrew and feed rod cannot be engaged simultaneously; neither can feed and power rapid traverse.

4. Leadscrew reverse cannot be engaged with spindle rotating above 340 R.P.M.

series 62 lathe–
productivity and precision



PROTECTED GEAR BOX AND END GEARING

1. Gear box and end gearing totally enclosed. Lubrication is kept in, dirt kept out, original accuracy maintained.

THE BED...A FIRM FOUNDATION

1. All four bed ways flame hardened and precision ground to keep them factory-fresh for years to come.
2. Generous size chip pans are designed for easy chip removal at front or rear.
3. Longer machines equipped with traveling rod supports which are automatically picked up and dropped off by apron.

TAILSTOCK THAT MEANS BUSINESS

1. Either single speed or two speed range type available with dead or anti-friction center spindle. Sufficient mass and rigidity to support the heaviest of cuts.
2. Movement along bed manually or by power. This combination satisfies all turning conditions.

SUPERVISORY PROBLEMS SIMPLIFIED

1. At a quick glance, supervisor may check (a) work diameter setting, (b) SFPM setting and (c) H.P. consumption. This makes it possible easily and quickly for him to assure full productiveness of machine and operator at all times.

ADDED EQUIPMENT FOR ADDED PRODUCTION

1. Additional equipment in vast variety is available for the Series 62 line. Consider, by all means, the advantages of the "Air-Gage Tracer," a means by which thousands of users have reduced costs substantially.
2. Ask for descriptive booklet No. 1506 which not only describes the basic machine but the commonly used items of additional equipment. It includes full specifications.

Monarch
TURNING MACHINES

THE OTHER DESIGN

How the copper metals can improve production as well as the product

How freely can you design for performance? How inhibited are you by the production requirements of your equipment and your materials?

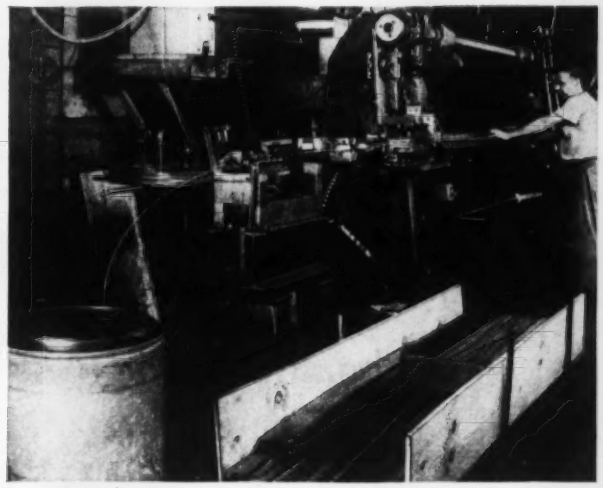
When the materials of design are the copper metals, there are many ways, old and new, of converting the pilot model into mass production. In fact, the production versatility of these metals is as important as are their functional advantages. The facility of copper and its alloys for forming, machining, joining and finishing gives the product engineer greater latitude by helping him solve the *other* design problem — the problem of production.

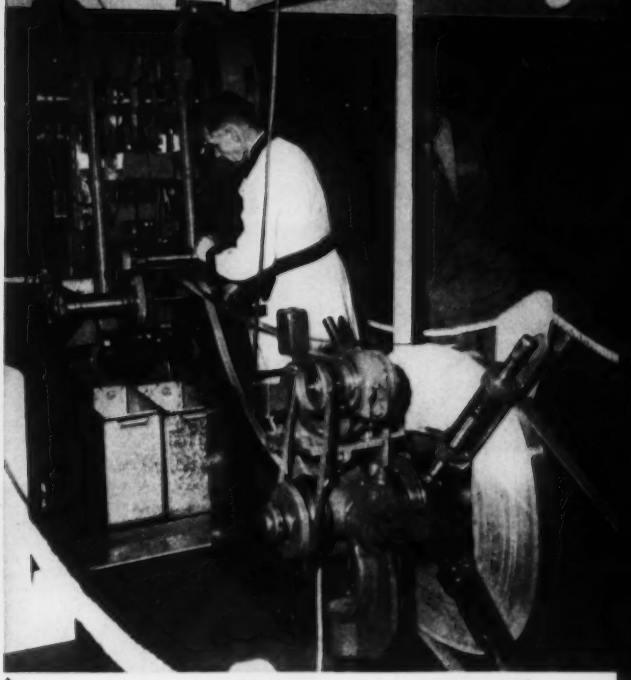
Forming Methods

Various of the copper metals have the *ductility* for easy spinning, stamping, pressing, cupping and deep-drawing. They have the *malleability* for intricate and accurate forging, cold heading, coining, embossing, extruding, knurling, swaging, etc. Many are readily *machinable* at high speeds and feeds. They can be *cast* into large or intricate shapes. Copper and its alloys can be easily *soldered* — or, for even stronger

DESIGN FOR PRODUCTION is often aided by the copper metals. These screw machine parts (shown slightly larger than actual size) for gas conversion appliances are mass-produced at the rate of millions per year. They require a wide range of secondary machining operations, such as slotting, milling and cross drilling. Free Cutting Brass has the machinability and uniformity to help keep production high and efficient, no matter how exacting the operation. Some of the orifices, for example, must be made with drills as small as No. 80 (.0135").

PROBLEM





LESS DOWNTIME and less handling result from longer lengths of brass mill products. The barrel-feed coils at left feed a continuous hinge machine for conversion to hinge pins. Long coils of strip above are being drawn into cups in the press.

joints, *brazed* with either silver-base or copper-base alloys. Many of the copper alloys can also be economically joined by modern methods of arc welding and oxyacetylene welding. Some of these methods are entirely automatic.

Manufacturing Economies

A number of factors, besides easy forming, machining and joining, are resulting in considerable savings in the fabrication of the copper metals. These include reductions in manufacturing time due to preforming, reductions in scrap due to the availability of custom shapes from the brass mills, and the high resale value of the limited scrap produced.

Die-pressed forgings and special extrusions of precise cross-sectional form are among these important cost savers. For example, the brass yoke of the float valve shown at right was formed from an extrusion at a savings of 40%, in time and metal, over previous methods. An extruded shape costs more per pound than standard rod or bar, but the reductions in machining, forming and finishing costs may save you far more than the difference in initial price.

CUSTOM EXTRUSIONS SAVE 40% in the fabrication of this brass yoke for a ball-float valve. Custom extrusions like this save both metal and manufacturing time. They machine readily, are accurate in dimensions, and are available in long mill lengths to facilitate automatic operations.

Automation Requirements

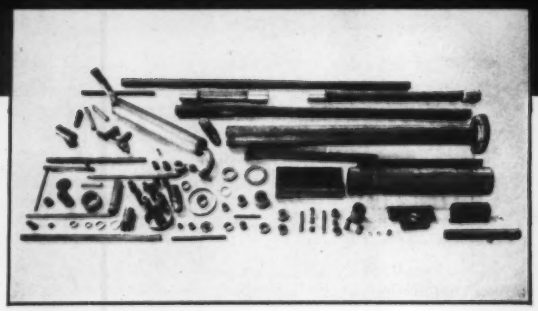
The copper metals can make automation more efficient. Machinability is one of the reasons. Many of the alloys can be milled at high speeds and feeds. Tools last longer and downtime is reduced.

Longer continuous runs are also made possible by the long lengths that the mills can now supply. The barrel-feed coils of wire and the extra-length coils of strip shown above are widely available. Greater-than-mile lengths of .005" gauge Cartridge Brass, 70%, for example, are frequently supplied for use in presses, eyelet machines or roll formers.

These recent developments in the copper industry, and the fabrication properties of the copper metals themselves, let you take full advantage of these metals by helping you to solve "the other design problem" – design for production. A 16-page reprint of "How to Get More for Your Metalworking Dollar – Copper and Brass" is available from the Copper & Brass Research Association, 420 Lexington Avenue, New York 17, New York.

There's a new frontier in...

COPPER · BRASS
BRONZE



Seven-million miles of street and industrial sweeping in 700 cities have proved rugged dependability of Wayne Manufacturing Company's equipment. Here is the final assembly line in its plant. Large horizontal tube on sweeper is jack shaft housing for gutter broom drive. Wayne makes 300 parts from Pittsburgh Steel's Seamless cold-drawn tubing (see inset at right). That's how . . .

Pittsburgh Steel Seamless Tubes Help Wayne Make Clean Sweep

Nobody knows how many brooms it would take to keep the world clean. But out in Pomona, California, Wayne Manufacturing Company is ready to tackle the job with a complete line of power sweepers.

Founded only ten years ago, the Wayne Company has grown rapidly until today it produces more street and industrial power sweepers than all others in the field combined. Wayne is the only power sweeper produced by assembly-line operation.

Largest Wayne sweepers handle up to four cubic yards of debris at a time. Their assembly requires more than 1,000 complicated and accurately manufactured steel parts.

• **300 Key Parts**—Of these, more than 300 key items are fabricated from Pittsburgh Steel Company's Seamless Tubing in both carbon and alloy grades in sizes ranging from one-quarter inch to six inches in diameter It is furnished cut to length and ready for fabrication by Baker Steel & Tube Company of Los Angeles, a Pittsburgh Steel distributor.

This service helps speed Wayne production, keeps inventories down and is typical of service rendered by all Pittsburgh distributors.

"Requirements for the parts produced from Pittsburgh tubing are exacting," says Wayne production vice-president, Roy E. Nelson. "Our sweepers are doing big jobs, many of them operating on a 24-hour schedule, and we

must have a tough, dependable product in the critical spots to take this constant heavy beating."

That is why Wayne uses Pittsburgh Seamless Tubing in critical components such as rugged axle assemblies, torque housings, drive shafts, hydraulic actuating cylinders—even small fittings.

Over the years, Wayne production men have found Pittsburgh tubing has the surface finish, close size tolerance and concentricity which minimize the amount of machining that must be done. Its uniformly high physical properties and internal soundness provide the stamina necessary for long, trouble-free service.

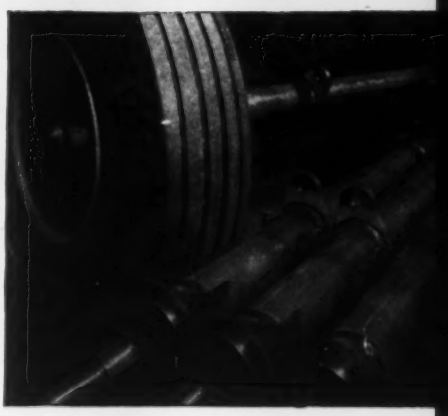
• **Ease of Fabrication**—The machinability and weldability of Pittsburgh tubing make for ease of fabrication, keep scrap losses down, and assure uniform parts—all important factors in keeping production lines moving smoothly.

As an aid to industrial good housekeeping, Wayne produces smaller power sweepers for use inside and outside plants. Its newest line is the Autoette series which includes the glamorous "Golfmobile" and the family "Cruise About." Three industrial models provide efficient transport of personnel and materials in sprawling plants.

These industrial sweepers and Autoettes also depend upon Pittsburgh Steel tubing for parts in key assemblies.

Manufacturers find the uniformly high quality of Pittsburgh cold-drawn steel seamless tubing and excellent service from Pittsburgh distributors are big assets in improving products and operating efficiency. To enjoy these benefits get in touch with the representative nearest you.

Machinability and weldability of Pittsburgh tubes are vital in making this shaft which goes into differential assembly. Short tube is welded over longer, smaller diameter tube, then machined to tolerance of .001 inch to assure perfect fit in housing.



Rugged front axle assembly of Wayne sweeper made from Pittsburgh tubes carries most of weight of machine and up to four cubic yards of debris. It must withstand road shocks and constant heavy-duty operation.

Pittsburgh tubes withstand torque and fatigue in main and auxiliary drives on Wayne sweepers.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.
Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

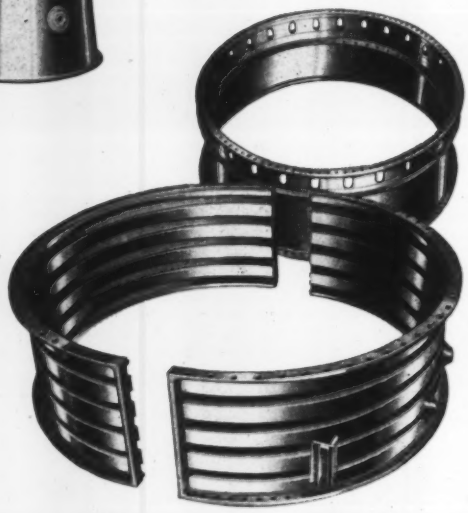
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

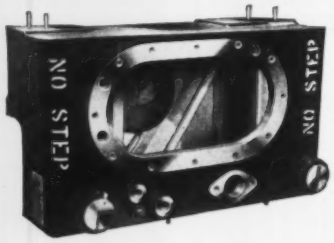
District Sales Offices

Atlanta
Chicago
Cleveland
Dallas
Dayton
Detroit
Houston
Los Angeles
New York
Philadelphia
Pittsburgh
Tulsa
Warren, Ohio

Looking for a Fabricating Source...



of welded precision assemblies?



As a major producer of circular parts and welded components for the aircraft industry, Amweld® possesses special knowledge and techniques for forming, welding, and machining of assemblies. Fabricating of aluminum, titanium, stainless, and heat-resistant alloys is a major part of this work. Experienced metallurgical and engineering staffs, plus a skilled work force, make up this team of fabricating specialists which is available to you on a subcontracting or experimental work basis.

If you would like to obtain complete information on the capabilities of American Welding and how we can be of assistance to you—phone or write today. Our local representative will be happy to call and discuss your requirements.

THE AMERICAN WELDING & MANUFACTURING CO.
110 Dietz Road • Warren, Ohio

AMERICAN WELDING

Write for complete information.
NEW 20-page catalog of Amweld Rings, Bands, and Welded Assemblies.
NEW booklet entitled, "HOW AMWELD FLASH BUTT-WELDED RINGS ARE PRODUCED."

Component Makers See Uptrend Continuing

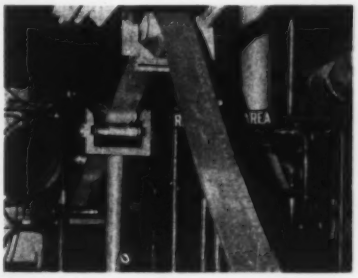
You'll have to allow more delivery time on your orders for parts in coming months. Reason: Partmakers report that orders are still on an uptrend—though they're not climbing as rapidly as they did last quarter. Order gains of 10 to 15 per cent over 1958's last period rate are most commonly predicted (Page 33). Shipments are lagging behind the quickened order pace but will catch up this quarter. Backlogs are inching up as orders increase and leadtimes extend. The big question in the inventory picture: Will there be a steel strike?

Antimerger Drive To Strengthen

Watch for the Justice Department to step up its antimerger campaign. The decision handed down by Judge Edward Weinfeld in the Bethlehem-Youngstown case is spurring the effort. At press time, the two companies had not announced whether they would appeal the case. If the Supreme Court allows Justice Weinfeld's opinion to stand, the government will have a much broader and stronger weapon in the Clayton Act. The Justice Department has 104 antitrust cases pending. It filed 57 last year—one more than in 1957. For comparison, only 36 were filed in 1952, the last year of the Truman Administration.

New Process Pares Partmaking Costs

Watch for the ingenuity of a Colorado brewery to trim the cost of impact extruded aluminum parts. Adolph Coors Co., Golden, Colo., has licked the problem of continuously casting thin aluminum strip; pigs are converted to extrusion slugs in a nonstop operation (Page 70). The process spells greater competition between aluminum and steel.



Top Talent Will Be Tougher To Get

Competition for top college graduates will be more rugged this year than last. To get the men you want, you may have to pay starting salaries averaging $7 a month higher. That's the consensus of 194 companies surveyed by Northwestern University. They expect these average starting salaries: Engineering, $480; accounting, $422; sales, $419; general business,

$413; other fields, $438. The firms plan to hire 13 per cent more technical and 19 per cent more nontechnical grads this year than last. The survey discovered that the nontechnical graduate overtakes his engineering classmate, salarywise, in ten years. Average pay after a decade of service: Engineering, $778; accounting, $783; sales, $866; general business, $788.

Roger Blough Predicts 1959 Business Climate

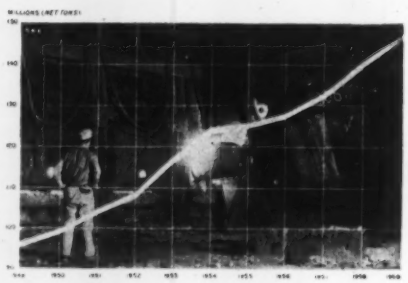
The steel industry may reach an operating rate of 80 per cent (1958 capacity) during the first six months of this year, believes Roger M. Blough, chairman, U. S. Steel Corp. That compares with 54 per cent during 1958's like period. The auto industry will show the greatest buying improvement; the construction, farm implement, appliance, and machinery industries will also consume more steel, predicts Mr. Blough. He looks for "modest gains" in plant and equipment spending. Longer lead-times, resulting from the quickened order pace, will trigger inventory building, he says.

And Emphasizes Four Imminent Problems

Mr. Blough sees these serious problems confronting the U. S. economy this year: 1. Meeting a probable $12 billion fiscal 1959 deficit, with resulting inflationary implications. 2. Negotiating new labor agreements which will not add fuel to the inflation fire. 3. Strengthening our industrial and scientific might to meet Soviet economic aggression. 4. Reforming our tax depreciation system.

Where Steelmaking Capacity Is Going

America's steel producers added 6.9 million tons of capacity last year, boosting the total to a record 147,633,670 tons (Page 35). Mounting interest in oxygen steelmaking is one reason for the addition of facilities at a time when capacity far exceeds production. Bessemer capacity continues to decline.

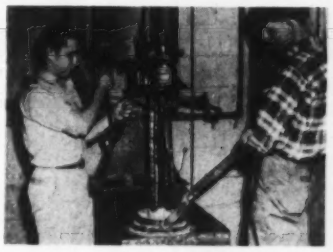


Your Social Security Costs Are Climbing

Your tax for social security will rise 80 per cent over the next decade under the present law. And the odds are in favor of that figure being boosted. The rate you and your employees pay rose ¼ of 1 per cent on Jan. 1, and the taxable wage base was lifted to $4800 a year (from $4200). That means that you and your employees will pay—at the maximum—$120 per man this year. By 1969, the maximum will climb to $216—or more if some

liberal Congressmen have their way. There's a move underway to get Congress to increase benefits for the 12 million old people now eligible for Social Security.

Can Hafnium Get a Good Civilian Job?



Small quantities of hafnium may become commercially available soon. It will give alert metalworkers an opportunity to investigate the Atomic Age metal as a possible solution to their problem jobs. Short supply and high price deter companies from putting its unusual properties to work for them now (Page 39). It is currently used to make control rods for nuclear reactors, whose builders want more hafnium than they can get. The U. S. completed 37 reactors and started building 45 more last year (Page 40). The market for nuclear components is growing.

1959: Record Year for Plastics

Expect plastics to give metals more competition this year. And watch for more metalworkers to find jobs for synthetics. Society of the Plastics Industry predicts production will hit 2.5 million tons in 1959, vs. 2.27 million in '58. At the right is what 365 SPI members look for in 1959's first six months:

	Expect increase	Expect decrease	Expect no change
Sales	70%	6%	24%
Profits	47%	13%	40%
Employment	44%	6%	50%
Prices	10%	13%	77%
Material costs	20%	9%	71%

Sixty-eight per cent of the respondents plan to expand capacity this year.

How To Keep Employees Informed

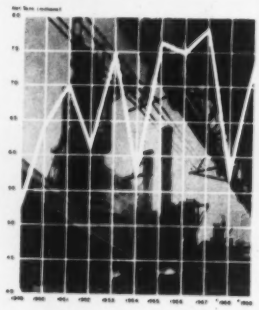
For as little as a nickel per employee, you can go a long way toward giving your people a clear understanding of company policies and practices (Page 45). Letters to an employee's home can give his whole family a clearer insight into the everyday problems of your business. "Employees welcome the practice," says R. C. Wentz, manager of General Electric's communications & community relations, Large Lamp Dept.

Long Term Leasing Gains Popularity

Look for a record number of metalworking plants to lease equipment, rather than buy it, this year. Robert Sheridan, president, Nationwide Leasing Co., Chicago, says more than $300 million worth of equipment may be on

long term lease by the end of the year, vs. about $227 million now. The growing volume of defensework leads to more leasing because of the uncertainty of government orders being renewed. Mr. Sheridan also reports a trend toward the sale-leaseback of equipment to create working capital.

Pig Iron: On the Upswing



Look for a moderate resurgence in pig iron output this year. Suppliers base their optimism on the brighter prospects in metalworking which will lead to greater steel ingot production. Pig iron production won't match 1957's record but will climb far above the 1958 pace (Page 92). It's another indication that the economy is preparing for a lasting uptrend.

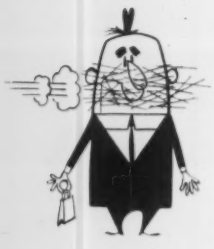
Chromate Coatings Give You Color Economically

"Brighten the corner where you are" has new meaning for those who make fancy dime-store racks, shelves, and knickknacks of zinc plated steel. A new colored phosphate coating offers a brilliant metallic luster for only about 1/50 of a cent per square foot (Page 74). The method works on any zinc surface. Some auto diecastings are being dipped to brighten your car's engine.

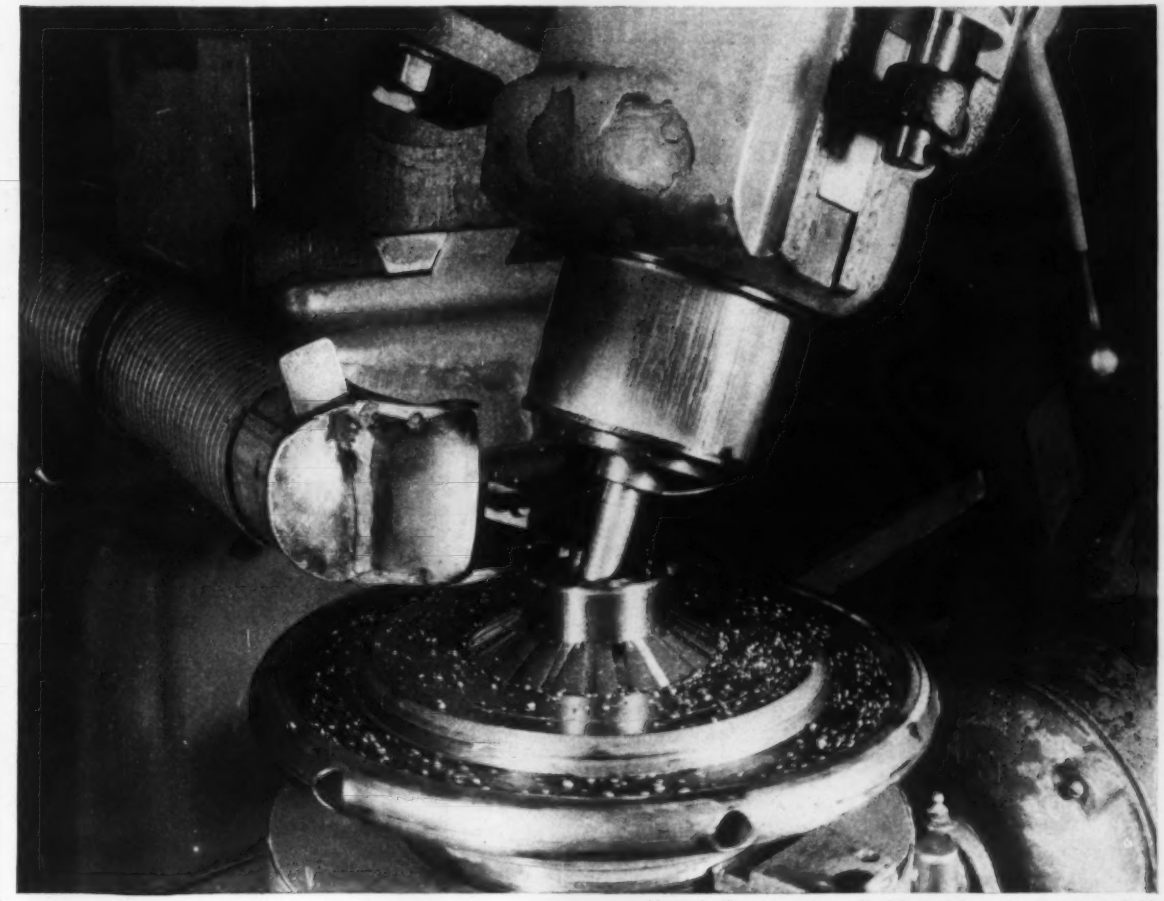
1958 Strike Toll More Severe than 1957's

In 1958, the U. S. economy lost 42 per cent more mandays due to work stoppages than in 1957—although there were 233 less strikes. Reason for the increase: About 800,000 more workers were involved in disputes in 1958 than in the previous year (Page 37).

Straws in the Wind



Businessmen polled by the U. S. Chamber of Commerce rank inflation, labor reform, and tax reform as the three top problems of 1959 . . . Don't look for the change in Cuba's government to hamper American businesses there . . . Sales of electronic products hit a record $7.7 billion last year . . . Unemployment in Canada is higher now than it was a year ago . . . Expect conveyors to make a better sales showing than most other classes of capital goods this year . . . J. I. Case dealers placed more than $200 million worth of orders at the company's recent world premiere in Nassau . . . Capital spending by the chemical industry will probably dip slightly this year . . . Aluminum Co. of America unveiled a new sandwich panel (aluminum sheets bonded to expanded polystyrene bead insulation) which Westinghouse will use for refrigerator cabinets. Westinghouse says it will allow much greater design flexibility due to substantially lower tooling costs.



Vertical milling operation at Fluid Packed Pump Co., Los Nietos, Calif.

SAVE...

with fast-machining steels from Ryerson

It will pay you to let a Ryerson representative help you select the steel best adapted to your operations. The Ryerson man can document cases of improvements up to 50% in parts machined per hour . . . of increases in tool life of 300%.

The nation's largest stocks of fast-machining steels of every type, including the carbon, alloy and stainless steels listed at right, are on hand at Ryerson ready for quick delivery. Call the Ryerson plant near you.

FREE-MACHINING STEELS IN STOCK

Ledloy® steels & screw stock—Ledloy rounds up to 4", squares up to 1½" and hexes up to 3". Also on hand—all your requirements for C1213, MX1213, and leaded and non-leaded C1117 and C1141.

Carbon steel tubing—All the sizes and wall thicknesses used by automatic screw machine shops are ready for shipment, including the new Ryerson development, lead-bearing seamless mechanical tubing.

Alloy bars—Complete selection of leaded alloys, including the Rycut® steels—fastest machining in their carbon ranges.

Stainless bars and tubing—Here, too, our stocks are the nation's largest including easy-machining Types 303 and 416 in rounds, hexagons and squares.

Carbon steel plates—New E-Z-Cut® Plates (Hot Rolled, Low Carbon Manganese).

RYERSON CERTIFIED QUALITY

RYERSON STEEL®

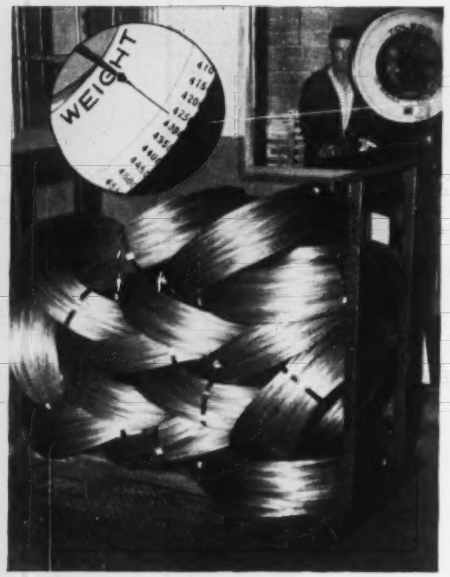
Member of the INLAND® Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Bright Wire Fabricators:
Now You Can Run 2 Tons of Wire Non-Stop and Save up to 13 Coil Changes by Using DSC-Portsmouth Long Production Run

LPR COILS



DSC-LPR BRIGHT WIRE COILS

Low and Medium Carbon

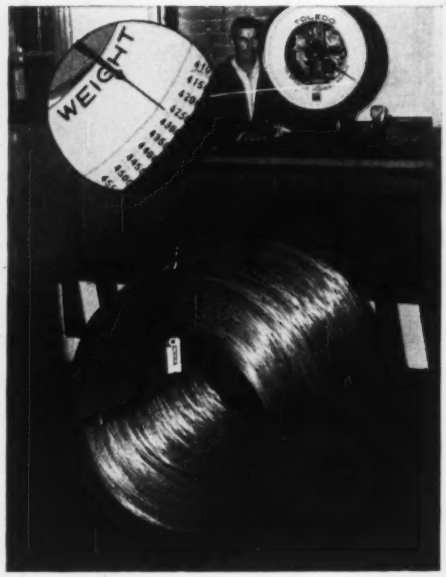
.072"/.500" Inclusive
(up to about 4000 lbs.)
.0475"/.062" Inclusive
(up to about 1000 lbs.)

High Carbon

.080"/.250" Inclusive
(up to about 4000 lbs.)

●

Here are two loads of Bright Wire, each weighing 4,250 pounds:
On the left, 14 standard coils; on the right, a single DSC-LPR coil. (Notice how the LPR stands up by itself.)



THE SIMPLE ARITHMETIC OF LPR COILS—Each time you stop a machine to feed the "next" coil of wire, you pyramid your production losses three ways: (1) you build up idle time costs; (2) you increase costs and delays by more frequent set-up adjustments; (3) you multiply individual coil remnant scrap losses. *Such losses are directly proportionate to the number of coils used for a given job-weight.*

LPR's cut down production lulls and their contingent costs. Possessing far greater density than standard coils, LPR's save handling time and storage space. LPR's also improve inventory control. Besides LPR's rid you of the bother and expense of returnable carriers.

LPR ECONOMIES REPORTED BY TYPICAL USERS—

"We cut our unloading time in half."
"We reduced our coil storage space 15%."
"We quit using small-coil storage racks."
"Our man-hour costs dropped 20%."
"No more returnable gimmicks for us."
"We cut our scrap losses by 90%."
"In our cutting, straightening and flattening department, one operator now runs four machines, against three machines previously."

Make your own production-test of LPR's. For quick, complete information on LPR's or on other DSC Products and Services, call your nearest DSC Customer "Rep" or drop us a line at Detroit . . . make it soon?

Customer Satisfaction Is Our Business

DETROIT STEEL CORPORATION
GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:
Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio, Dayton, Ohio, Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Houston, Texas, Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York City, Rochester, N. Y., St. Louis, Toledo, Worcester, Mass.

The PROOF of DSC STEEL is in its PERFORMANCE on Your Job

DSC PRODUCTS: Coke . . . Coal Chemicals . . . Pig Iron . . . Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods . . . HR and CR Sheet and Strip . . . Flat CR Spring Steel . . . Manufacturers' and H.C. Specialty Wire . . . Welded Wire Fabric

How To Fight Labor's New Threats

With the 1958 recession and labor's resounding victories at the polls now in the background, you can expect the unions to swing the big stick on two fronts (at home and Washington) in 1959.

On the home front, they will ask for higher wages and increased benefits.

The pattern was set at the November convention of the United Steelworkers of America. Delegates made it clear that the USW will ask for "substantial improvements" in wages, Supplemental Unemployment Benefits, vacations, pensions (based on length of service without regard to age), insurance, holidays, and premium pay for weekends and nightwork. Another demand will be the reduction of the 8 hour day and the 40 hour week (which Reuther will also ask for in 1960).

You can expect Dave McDonald to put up a tough fight in negotiating a new steel contract to replace the one expiring June 30. It will apply to some 1500 companies, plus hundreds of others that must abide by the same terms.

On the Washington front, labor will capitalize on its victories at the polls in November.

AFL-CIO President George Meany says the unions do not plan a labor party but will be "political" to whatever extent necessary to achieve their aims. The pressure on Congress will be applied by a crew of lobbyists headed by former Congressman Andrew J. Biemiller of Wisconsin.

Demands for changes in national legislation will include uniform unemployment benefits, a national health insurance program, an increase in minimum wages from $1 to $1.25 an hour, and repeal of Section 14(b) of the Taft-Hartley Act, which grants the states the right to outlaw the union shop.

In a comparatively few years, the unions have attained monopoly power that can paralyze the nation's economy. It can be used at the whim of unscrupulous union leadership—and often contrary to the wishes of the rank and file.

In fighting such power, management must give workers the facts on costs, wages, productivity, and profits.

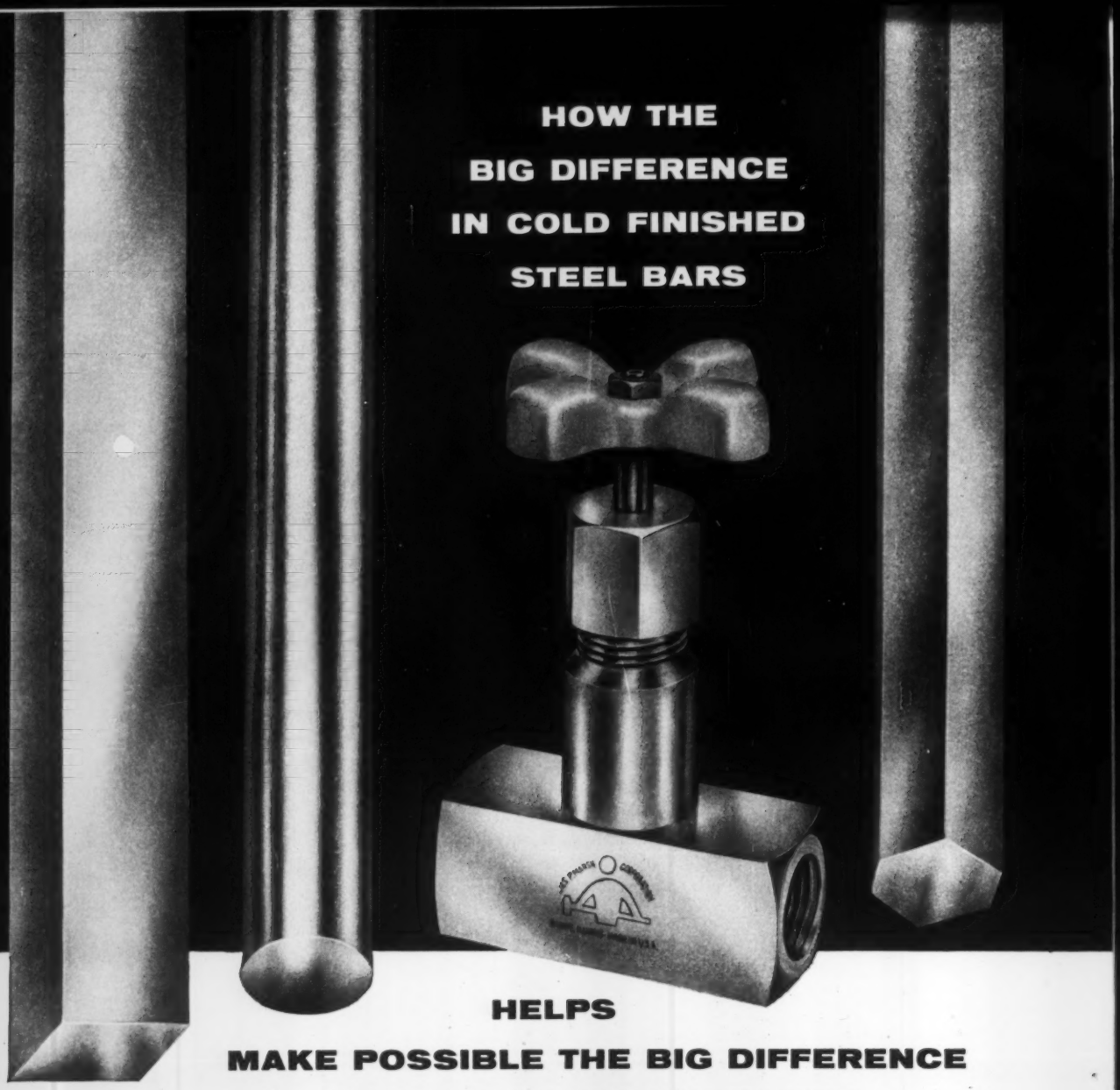
It must press for legislation that will place union control in the hands of union members—where it belongs.

It must take a stiffer stand in dealing with union demands that are out of line with increases in productivity.

Irwin H. Such

EDITOR-IN-CHIEF

HOW THE BIG DIFFERENCE IN COLD FINISHED STEEL BARS



HELPS MAKE POSSIBLE THE BIG DIFFERENCE IN MARSH NEEDLE VALVES

Micrometer regulation and positive shutoff at both extremely high and low pressures were sought for a new precision valve at Marsh Instrument Co., Skokie, Ill. The result was the first throttling and shutoff needle valve that operates efficiently and safely at all pressures up to 10,000 psi.

The big difference in the Marsh valve is the unique one-piece construction from cold finished bar steel. The body and stem guide are fused into one piece by the exclusive Marsh "Conoweld" process. There is another important difference, too. The body, packing nut and packing gland are electro zinc plated, which, with the stainless steel stem, not only provides corrosion-resistance but a clean, glistening, quality appearance.

Bliss & Laughlin's Lusterized® cold drawn bar steels are used by Marsh for this unique valve. Free from drawing oils, lime and processing grit, B&L Lusterized bars contain a minimum of processing contaminants to interfere with Marsh's fusion process and precision machining. B&L Lusterized bars also readily take the zinc plating without elaborate preparation because they start out cleaner, brighter and are easier to handle.

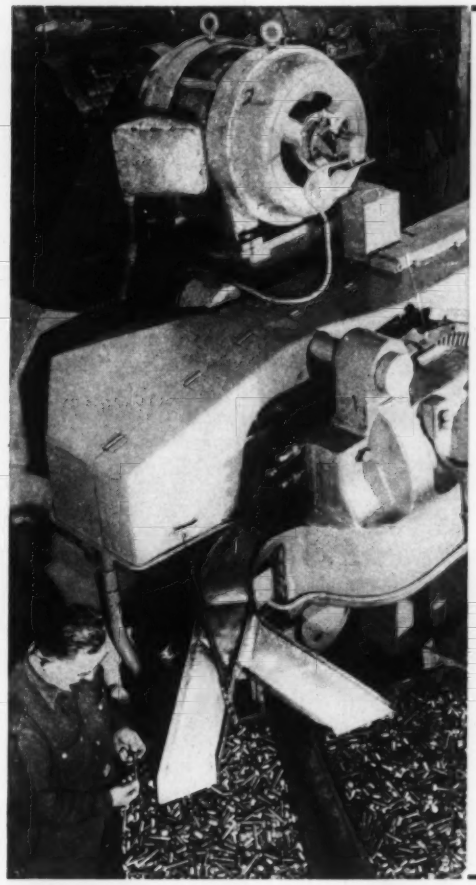
There is a good chance the big difference in cold drawn bars—the B&L Lusterized difference—can contribute importantly in helping establish a big difference for your product, too. It's worth checking, especially since you pay no more when you specify "Bliss & Laughlin Lusterized."

Originators of LUSTERIZED® Finish—The BIG DIFFERENCE in Cold Drawn Steel Bars

BLISS & LAUGHLIN

GENERAL OFFICES: Harvey, Ill. • PLANTS: Harvey, Detroit, Buffalo, Mansfield, Mass.

Specialists in Finish, Accuracy, Straightness, Strength and Machinability



Bethlehm Pacific Coast Steel Corp.

Component Outlook at a Glance

NEW ORDERS . . .

The upturn which began in mid-1958 is continuing into 1959 for the most part. A sizable minority reports a leveling off at the fourth quarter rate.

SHIPMENTS . . .

Because of leadtimes, the upturn in orders has not resulted in a proportionate rise in shipments. They will build up during the first quarter.

INVENTORIES . . .

Both producers and customers have been slow in rebuilding extremely low stocks. The buildup will begin late this period or early in the next.

BACKLOGS . . .

In most cases, the only direction they could go is up. As orders increase, so will backlogs. But pre-recession levels won't be hit in near future.

Partmakers See Good First Half

MAKERS OF COMPONENTS checked by STEEL within the last ten days are mildly optimistic about first half business prospects. They see a continuation of the uptrend sparked by the automotive and appliances industries, and they see the beginnings of a modest rise in such capital goods segments as heavy industrial machinery, railroad equipment, and road building machinery.

A large majority of the 50 top executives queried (they represent a dozen component industries) foresees a moderate increase in new orders during the first quarter. Some figure on bettering a good fourth quarter by 20 or 25 per cent. But most count on gains under 15 per cent. Practically all agree that this period will be far better than the corresponding 1958 period.

• **Cautious Group**—In practically every industry covered, there was at least one official who feels that this quarter will be no better than 1958's best. A few even thought orders might drop below the fourth quarter rate.

Four factors seem to be holding back a boom psychology:

1. Too much of the current uptrend is based on auto and appliance orders. Many say that even though motordom is the most active market now, it has not lived up to expectations. Others feel that if automotive sales do not back up Detroit's optimistic forecasts, the recovery could fall pretty flat. In the Midwest, some partmakers hint that appliance people are talking better sales than the facts warrant.

2. Many businessmen indicate that the big upswing came last quarter and that a leveling off is in progress.

3. A few executives say they have not had a substantial upturn. But judging from predictions of the economists, they expect to show gains in 1959.

4. The possibility of a steel strike in mid-1959 creates doubts about the authenticity of a first half upturn. There is little evidence of any wholesale inventory buying right now, but there are indications that it will come within the next

three months (see STEEL, Jan. 5, p. 441). It would represent a false recovery, some assert.

• **Shipments Catching Up**—Despite those reservations, shipments are expected to climb this quarter. While leadtime for most parts is at a minimum, there is still some lag between sales and shipments. The production requirements of customers are growing larger, but they have made little effort to build inventories. They are letting the suppliers carry their inventories, expecting to get fast delivery. The increase in piecemeal orders is beginning to put a strain on some partmakers' schedules. They hesitate to put on extra help or overtime (which cuts into already narrow profit margins). So leadtimes are tending to lengthen.

Industry by industry, here is what STEEL found out:

• **Bearings**—One large manufacturer expects orders this quarter to rise 5 per cent above the fourth quarter level. Another says 3 or 4 per cent but implies that his estimate is under constant review because of the way Detroit is ordering. "In two of our plants, 25 per cent of December's shipments were not visible in orders or releases at the first of the month," says the president. Active markets: Automotive, farm equipment, steel mill equipment, and road building machinery. Least active: Machine tools.

• **Diecastings** — "The number of new dies ordered in the last two and a half months augurs good business in the first quarter of 1959," says one industry official. Automotive orders are especially important here. One shop tied closely to the industry is operating better than two shifts a day, five days a week. Another says orders this quarter will be 30 per cent better than the fourth quarter's. But another says business is nothing to rave about. Other active markets: Appliances, business machines, outboard motors, and electronics. Least active: Aircraft and toys (a seasonal industry).

• **Fasteners**—The first is expected to be better than the last quarter but not much. One eastern producer says the new order rate has slipped beneath that of October and November. But a Chicago official says: "It's not too tough to get volume. It's making a profit that's hard." Another says: "The appliance market is not too hot. We know they're building inventories at the moment." But, practically all customers are more active than they were several months ago.

• **Electric Motors & Equipment**—New orders this quarter will about equal those of the fourth quarter last year, although one midwest producer anticipates a 5 to 10 per cent pickup. Most markets will be up, although significant gains in capital goods will not come before midyear. "Customers are holding inventories low, and that is what makes it tough now," says an eastern manufacturer.

• **Ferrous Castings** — Gray iron, malleable, and steel foundries are getting more orders, partly because of increased buying from heavy equipment makers. A Cleveland official says railroad business is finally showing signs of life. A Chicago founder says machine tool business is looking better. Another Chicago man says inventories are extremely low, causing a rush of hand-to-mouth orders. "But the rush feels good," he adds.

• **Forgings**—New orders in the first quarter will be about 10 to 15 per cent over those in the last period. Here as elsewhere, short leadtimes are bothersome. A Pittsburgh sales manager says: "Incredible as it seems, we're getting some orders in midmonth for delivery on the first of the same month."

• **Gears**—New orders are holding at about the fourth quarter rate. Two large midwest producers report increased activity from machine tool customers, although one says a good part of it is price shopping. A New York sales manager says the pickup has been across the board.

• **Industrial Rubber Goods**—Automotive and appliance customers are largely responsible for the uptrend here. Orders are leveling off at the fourth quarter rate. But H. E. Humphreys Jr., chairman of the United States Rubber Co., New York, says sales of industrial rubber products in 1959 will closely parallel the uptrend in the Federal Reserve Board's industrial production index.

• **Nonferrous Castings**—Stability at the fourth quarter level is the status of this industry. And that quarter was pretty good. A Chicago executive declares: "We've got a 60-day backlog now. That's not considered normal, but it's sure a good feeling over what we experienced at some periods in 1958."

• **Screw Machine Products**—This is one of the slower industries now, STEEL finds. This quarter should be a little better than the fourth. A lot will depend on how fast the automotive and appliance makers firm commitments.

• **Springs**—Here, too, the automotive industry is the big factor. If present schedules are realized, orders this year will be considerably better than last year's. Also, a Cleveland company president asserts the 1959 models may be using more coil springs per car than they did in '58.

• **Stampings**—A 10 to 15 per cent improvement in sales can be traced largely to the automotive and appliance industries, and those two users probably will determine the extent of the 1959 recovery for stampers. But at least one firm in New York says that shipments to the electronics industry are strong.

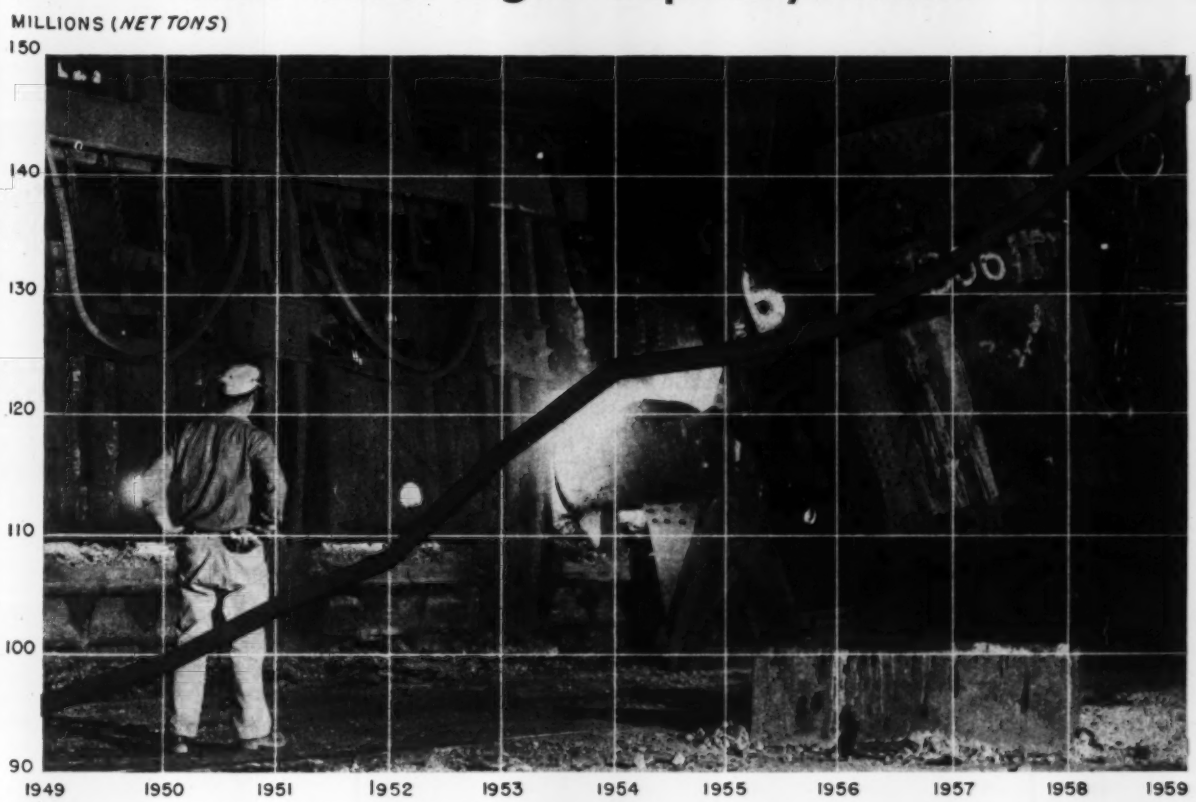
Military Electronics Up

Defense projects helped to increase 1958 sales of Hughes Aircraft Co., Culver City, Calif., to nearly $500 million.

Production items the company unveiled during 1958 included the MA-1 airborne integrated control and armament system; long range radar which computes distance, bearing, and altitude; the super Falcon guided missile; and a punched tape and computer operated machine tool line.

Expansion plans include moving into a new plant at Fullerton, Calif., where ground radar systems are to be manufactured, and remodeling of a Newport Beach, Calif., facility for the development and production of silicon and germanium diodes and transistors.

How Steel Ingot Capacity Grows



As of Jan. 1.

Steel Capacity Soars to New High

THE POSTWAR SURGE in America's steelmaking capacity continued in 1958, reports the American Iron & Steel Institute. Producers added 6.9 million tons, sending the total to an all-time high of 147,633,670 tons.

Capacity has grown each year since 1947. It stands 61 per cent above the Jan. 1, 1946, mark (91.9 million tons).

The increase in 1958 was the third greatest on record, despite the recession. In 1952, capacity spurted nearly 9 million tons. In 1957, it advanced 7.3 million tons.

• **Why It's High**—The ability of steelmakers to turn out 147.6 million tons may appear excessive in a year when most estimates peg production at about 110 million tons. AISI points out that capacity is 30 million tons over the industry's greatest production year. (In 1955, output hit 117 million tons). Explains AISI: "This provides a large amount of reserve capacity, which is available for national emergencies and for the growth of the population of this country."

In gearing for peacetime expansions in demand for steel, the industry has outstripped the population's growth rate. Our population has gained 28 per cent since Jan. 1, 1946.

Much of the 1958 increase is attributed to growing interest in oxygen furnaces. Several plants have new furnaces, boosting capacity from 1,081,000 tons at the start of 1958 to 4,033,160 tons.

• **Bessemers Drop Off**—Bessemer capacity is still on the decline. It was 5.2 million tons on Jan. 1, 1946; 4 million tons one year ago; and now it's 3.6 million tons.

• **Open Hearths Gain** — Open hearths account for over 85 per cent of total capacity. The new figure is 126.5 million tons, compared with 122.3 million tons at the beginning of 1958.

• **Electric Furnace Advance** — A moderate gain in capacity, from 13.3 million tons to 13.5 million tons, was posted by electric furnace operators.

• **Pig Iron, Coke Expand**—AISI reports increases in blast furnace and coke oven capacity. Blast furnace potential gained by 3.6 million tons to 94.6 million tons on Jan. 1, 1959. (See Page 92.) Coke oven capacity is rated at 73.1 million tons, compared with 72.2 million tons one year earlier.

What European Currency Shakeup Means to Metalmen

THE NEW YEAR got off to an uncertain start for U. S. exporters. Two European happenings have the immediate effect of slowing America's export trade. Their long term implications—stability and a higher standard of living—could work to our advantage, however.

The two events: 1. Establishment of the European Common Market. 2. Devaluation of the French franc. Both will limit the flow of American metalworking products into Western Europe.

• **Brighter Note** — Another European move—relaxation of monetary rules to provide a freer exchange of currencies—will liberate world trade from the currency restrictions and red tape that have distorted the international flow of money and goods since September, 1939. Both foreign and American businessmen will be aided by it. The nations shifting to convertibility: Britain, France, West Germany, Belgium, Luxembourg, Netherlands, Italy, Norway, Sweden, Denmark.

It gives international traders a wider choice of where they can buy and sell and it simplifies methods of financing. A Norwegian businessman with a shortage of dollars, for example, might previously have had to purchase a machine tool in the country whose currency he had, perhaps England. Now, if he prefers an American-made machine, easier convertibility of currency will make it possible for him to buy it.

• **Go Abroad**—The untying of European currencies will have another effect. It will add impetus to the overseas migration of U. S. business. The Common Market also encourages American private investment abroad. Many U. S. metalworkers are going after Western Europe business by expanding inside the Common Market. (Examples: Burroughs Corp. and Timken Roller Bearing Co. Timken is pouring $10 million into a new plant in France.)

Direct foreign investment by American industry has more than doubled since 1950. High U. S. labor rates have blocked access to foreign markets via the export route, so industry has taken another course —the establishment of overseas plants and foreign licensees. This trend explains why some U. S. industrialists expect sales from foreign operations to double in the next decade. The same men predict an increase in export sales of only 40 to 50 per cent during the same period. Some industries expect their export sales to decline—unless something is done to make American products more competitive pricewise.

• **Example**—Take the case of the American producer of multipurpose machine tools. The National Machine Tool Builders Association reports that American makers used to export 500 to 600 radial drills each year. In 1957, they exported 19. What's worse, about half the radial drills installed in the U. S. during the year were imported.

• **The Common Market** — France, West Germany, Belgium, Luxembourg, the Netherlands, and Italy will progressively reduce tariffs and quotas on trade between one another until the blocks are eliminated. By 1975, the six nations will form a single economic unit in which raw materials, money, finished products, and labor will move as freely as they do between Michigan and Missouri. Immediate effect will be to curb the flow of American goods into the area. It will also enable the six nations in the combine to build up their industry to the point where they will compete readily in world markets.

One brighter possibility: Lucian J. DeMore, president and treasurer, World's Products Trading Corp., Cleveland, says the Common Market could eventually benefit U. S. metalworking. Reason: The combine will tend to boost the standard of living in the area making it a richer market for world traders.

• **Revaluation of Franc — France**, suffering from intense inflationary pressures, realized her goods would be priced higher than those of other Common Market nations. With tariff equality, she could not compete. So she resorted to devaluation of her currency (from 420 francs to the dollar to 493.7 to the dollar).

Result: Foreign buyers will find French products relatively cheaper and Frenchmen will find foreign products relatively more expensive. France can now compete in the Common Market. Devaluation will improve her foreign exchange position by encouraging exports and discouraging imports.

• **New Strength**—A stronger, more solidified Western Europe is seen as the outcome of the series of events. Its governments are resisting inflation, removing the barriers to their world trade, and boosting their competitive positions.

The moves mean that labor and management will have to use restraint to keep U. S. goods from being priced out of more markets.

Imports Impede Southwest

Imports from Europe continue to prevent southwest steelmakers from making much progress toward full production. Foreign tonnages appear to grow month by month. During November, 1958, 57,169 tons moved into Texas ports (most came into Houston). Of the total, 30,665 tons were from Belgium.

Imports from Belgium in November far outtotaled shipments from a leading Texas mill. Between 75 and 80 per cent of the foreign tonnage moving into Texas ports is from that country. Included are structurals, reinforcing bars, angles, and wire products. Prices average $20 to $40 a ton below domestic figures. During the last quarter, appearance of Japanese plates made it difficult for mills to sell domestic plates to distributors.

Another worry is that European currency revaluations may result in even greater tonnages crossing the Atlantic.

Texas steelmen hope that some action will be taken at a Washington hearing Mar. 3 before the Tariff Commission.

Strike Idleness Up in '58

Number of work stoppages was below the 1957 level, but major strikes during the last four months of year boosted idleness to 23.5 million mandays, vs. 16.5 million in 1957

NOT ALL WAS quiet on the labor front in 1958, but strikewise it was the second lowest year for work stoppages since World War II. During the relative quiet, wage hikes were negotiated or put into effect for about 85 per cent of employees covered by major collective bargaining contracts.

Though work stoppages were fewer in number than they were in 1957, more workers were involved, resulting in more mandays of idleness, preliminary estimates released by the Department of Labor show.

• **In Last Four Months**—In the first eight months of 1958, strike idleness was below 1957 levels. Then major strikes by trucking, glass, airline, and newspaper workers boosted the tally. More than a third of the manday idleness in the last four months of the year was substantially the result of local stoppages in the automobile industry.

The estimated 3440 stoppages last year (just above the postwar low of 1948) directly affected about 2.2 million workers in nonagricultural establishments and caused about 23.5 million mandays of idleness.

The figures for 1957: 3673 stoppages, involving about 1.4 million workers with a total loss of 16.5 million mandays.

Here's a wage negotiation summary (construction, services, finance, and government not included) compiled by the Bureau of Labor Statistics:

• The year's bargaining situations, each covering 1000 or more employees, affected 6.8 million workers.

• Of those, some 3.5 million obtained increases as a result of settlements concluded during the year.

• Rate hikes were supplemented by cost-of-living adjustments in a number of cases.

• Some 3.3 million workers received wage boosts under various combinations of deferred and cost-of-living adjustments agreed upon in earlier year but made effective in 1958.

Raises averaged 12 cents an hour (about the same as in 1957). Six out of ten workers got that amount. A much smaller number gained 15 or 16 cents, while the proportion receiving either 12 or 17 cents rose significantly. The variations mostly resulted from larger cost-of-living adjustments in basic steel and related industries and smaller adjustments for the nonoperating railroad brotherhoods.

During the year, 8 cents an hour was the most common average rate increase negotiated. Including cost-of-living, the most frequent advance was 13 cents, with almost half of the 3.5 million workers affected by 1958 settlements receiving at least that amount.

A majority of the workers covered by 1958 negotiations also got increased supplementary benefits. Agreements for liberalized fringe benefits were negotiated at about the same proportion as in 1957. There was some decline in the number of supplementary benefits that were changed by each contract.

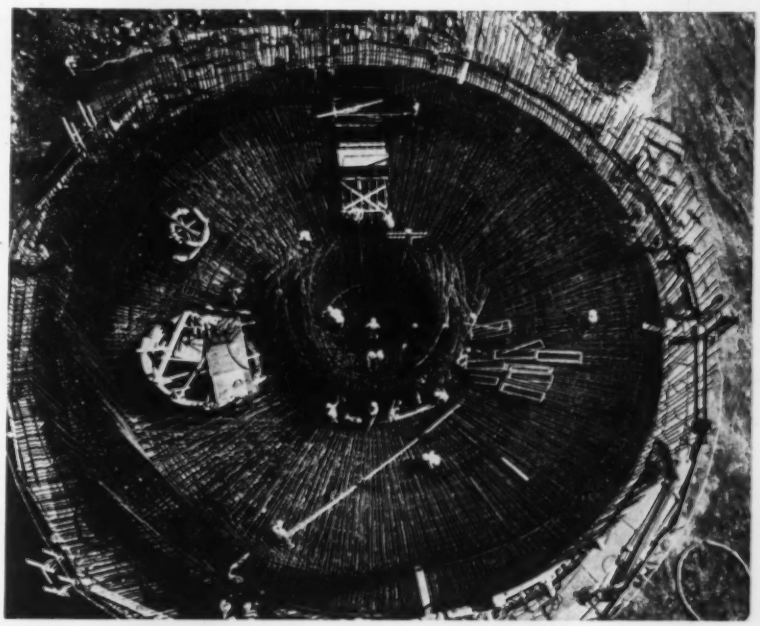
$36.5 Million Paid in SUB

Reports to the United Steelworkers show that $36,451,535 in supplemental unemployment benefits was paid by 18 basic steel companies during the first year of the plan, Sept. 1, 1957, to Aug. 31, 1958.

Records note $40,960,184 remaining in fund accounts with an additional $14 million held in escrow in Ohio and Indiana. Laws in those states banning collection of both SUB and state unemployment aid are being contested.

In spite of the plan's apparent success, a union staff member said, "It is evident larger contributions from basic steel companies are needed to carry out the intention of the plan."

The union has contracts with 557 steel firms covering 790,000 workers.



100 TONS OF REINFORCING STEEL are being placed around the base of this concrete structure which will house the nuclear reactor of Yankee Atomic Electric Co., Rowe, Mass. (See Page 40.) The building is to be enclosed in a sphere 125 ft in diameter, requiring 600 tons of steel and 12,000 tons of concrete

How Metalworking Aids Textron

	SALES (Millions)	METALWORKING (% of Sales)	EARNINGS (Millions)
*1958	$239	59	$7.9
1957	254	48	8.6
1956	245	40	6.5
1955	189	32	5.5
1954	99	15	1.3
1953	71	0.05	0.2 X

*Estimated, STEEL.
X Loss.

Metals Help Textile Giant

TEXTRON INC.'s diversification program in metalworking has put it back into the black. In five years, the Providence, R. I., company has pushed its earnings curve from the minus side ($200,000 loss) to a comfortable plus (nearly $8 million).

Though textiles still account for about 25 per cent of the company's sales, Textron now has 14 metalworking divisions which brought in about 59 per cent of its $239 million sales in 1958. (See table, above.) Textile and metal product shipments to the automobile industry approximate 20 per cent of sales, with metal products taking up an increasing share.

• **Here's Why**—Royal Little, chairman, says: "We originated in an integrated textile business and suffered from growing too large." As to the future, he comments: "We want to get wide diversification in unrelated businesses with the hope that all divisions will not go into the red at once during economic setbacks. We also feel that we can buy (for fewer dollars in relation to earning capacity) more manufacturing enterprises than we did in the 1955-56 boom."

Few companies have diversified to the extent that Textron has in metalworking. Its product parade now traverses a wide range—from electronic parts and small fasteners to rolling mills and heavy castings.

Some Textron companies were acquired by cash purchase, others by stock control and exchange. There have been some fizzles and some prompt, strategic retreats when the long range outlook for earnings was doubtful. Coquille Plywood Inc., acquired in 1955, was dropped in less than two years . . . Textron's bid for American Screw Co., Willimantic, Conn., failed following litigation which, in the opinion of management, would have pushed the price too high . . . Kordite Div., Macedon, N. Y., was sold to National Distillers & Chemical Corp.

• **The Keepers**—The company has had success with Waterbury Farrel Foundry & Machine Co., Campbell, Wyant & Cannon Foundry Co., and Camcar Screw & Mfg. Co., among others. (See listing, right.) In a yearend move, Textron and Olin Mathieson Chemical Corp., New York, jointly formed Almetco to produce aluminum extrusions for the parent companies. The new firm will own and operate two plants with combined capacity of 12,500 tons annually. Textron Metals Co., a Textron subsidiary, operates both plants and fabricates aluminum door, window, and siding products. Ormet Corp., a subsidiary of Olin Mathieson, will supply aluminum to Almetco.

Metalworking divisions making the best showing in the now fading recession are those producing their own end products, such as Hall-Mack, or those doing government work, such as Dalmo Victor.

Diversification and expansion have not ended for this giant in textiles. Textron's management is studying the potential of numerous metalworking plants and is negotiating for the acquisition of an outboard motor manufacturing division.

Textron Metalworking Divisions

ACCESSORY PRODUCTS
Whittier, Calif.
Pneumatic and Hydraulic Controls for Aircraft and Missiles

CAMCAR SCREW & MFG.
Rockford, Ill.
Metal Parts and Fasteners

CAMPBELL, WYANT & CANNON FOUNDRY
Muskegon, Mich.
Gray Iron and Steel Alloy Castings

CLEVELAND HOBBING & MACHINE
Cleveland
Heavy Precision Tooling

DALMO VICTOR
Belmont, Calif.
Radar Systems, Electromechanisms

FANNER MFG.
Cleveland
Foundry Supplies, Industrial Hardware

GENERAL CEMENT MFG.
Rockford, Ill.
Electronic, Radio, TV Parts and Tools

HALL-MACK
Los Angeles
Bathroom Accessories and Fixtures

HOMELITE
East Port Chester, Conn.
Power Saws, Generators, and Pumps

MB MFG.
New Haven, Conn.
Vibration Test Equipment and Eliminators

PRECISION METHODS & MACHINE
Waterbury, Conn.
Hydrogen Annealing and Steel Treatment

SHURON OPTICAL
Rochester, N. Y.
Frames and Optical Machinery

TEXTRON METALS
Girard, Ohio
Aluminum Products

WATERBURY FARREL FOUNDRY & MACHINE
Waterbury, Conn.
Rolling Mill, Bolt, and Screw Machinery; Power Presses

Can You Use Hafnium?

That's a question more metalworkers will be asking as prospects for commercial availability improve. Here's a roundup of the metal's status and its outlook

DON'T WRITE hafnium off as useless in your business. Several metalworking companies are trying to find ways to put its unusual properties to work for them.

Short supply and high price have discouraged widespread experimentation with this Atomic Age metal. And the Atomic Energy Commission has restricted its use. (Hafnium is ideal for control rods in nuclear reactors since its high thermal neutron cross section allows it to absorb neutrons.)

But Carborundum Metals Co., Akron, N. Y., a major producer of hafnium sponge, reports that small quantities of the metal may soon be commercially available.

Alert managers will want to keep abreast of new research findings and be aware of the metal's properties and potential. Graham Brown, vice president, Mallory-Sharon Metals Corp., Niles, Ohio, says his firm receives "a lot of requests for fractions of a pound of hafnium. Companies are checking into it as a possible answer to their problem jobs."

• **Applications** — Hafnium's only major use, at present, is in control rods. It's being considered as an additive in high temperature alloys. It's under investigation for use in gas filled electric lights and vacuum tubes. It's also being considered for cathodes in x-ray tubes. And it may find applications as a superrefractory. The glass industry is also investigating its properties.

Iodide purification of hafnium sponge yields a product that is ductile, malleable, and not too difficult to fabricate.

Hafnium oxide is resistant to chemical attack. Carborundum says it can be used as an insulator in high temperature work, as a raw material in the production of high temperature ceramics, and as a high temperature catalyst.

Hafnium carbide, nitride, boride, and silicate are getting considerable laboratory attention but "only academic interest has been shown so far," says one producer.

• **Supply**—No pure hafnium mineral has ever been discovered; it is found with zirconium. The properties of the two metals are so similar that the presence of hafnium in zirconium was not detected for more than a century.

Separating hafnium from zirconium is costly, so it's not removed from commercial grade zirconium. Our entire hafnium supply comes as a byproduct in the production of reactor grade zirconium.

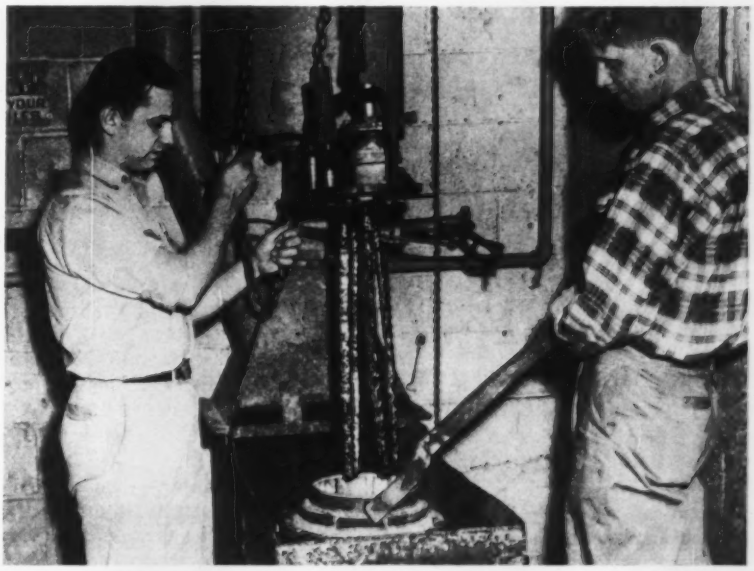
Since the principal buyers of reactor grade zirconium (AEC and commercial reactor builders, like Westinghouse Electric Corp.) also want all the hafnium they can get (for control rods), little of the metal ever reaches the open market. Atomic Energy Commission contracts for zirconium provide that all hafnium produced in the process must be sold to the AEC. And even that doesn't meet the demand. A spokesman for the Business & Defense Services Administration says there is a shortage of hafnium; cadmium and silver alloys are being used for control rods, but they are "poor substitutes."

• **Price**—For every 50 lb of reactor grade zirconium sponge produced, only about 1 lb of hafnium sponge is obtained. The ratio is even smaller in terms of finished mill products.

Such short supply makes the price high.

And it's an artificial price since hafnium supply depends entirely upon zirconium production rather than demand for hafnium. (The price is based on a percentage of the cost of separation.) Carborundum reports it has sold hafnium sponge on the open market for $25 to $30 a pound. If hafnium were produced independently, it would cost closer to $80 a pound, reports W. W. Stephens, manager of manufacturing for Carborundum.

• **Capacity**—This year, AEC contracts call for the production of 44,000 lb of hafnium sponge. At least 90,000 lb could be produced in the U. S. with present capacity, reports Mr. Stephens. That's because we



Workmen at Foote Mineral make hafnium crystal bars by the iodide process. Two hairpinlike wire filaments are heated and lowered into the deposition tube. Hafnium sponge in the tube reacts with iodine under pressure, depositing the crystal on the wire filaments

have the capacity to turn out 4.8 million lb of zirconium sponge. About 2.2 million lb will be produced this year.

We also have idle capacity for the conversion of hafnium sponge into crystal bars (which are melted and rolled into plates for reactor uses).

Foote Mineral Co., Philadelphia, converts the metal for the AEC. The charge is $15.50 a pound in lots of 5000 lb or more, the company reports. There has been a downward trend in this charge and "it's quite likely that the trend will continue," Foote asserts. The cost of hafnium sponge will probably inch downward, too, as zirconium production is stepped up, one sponge producer believes.

• **Production** — Zirconium production will probably be boosted a little this year, Mr. Brown believes, as our domestic power program and AEC programs gather steam. That means more hafnium will be turned out. Some reactor builders are now stockpiling reactor grade zirconium to get all the hafnium they need, since they often have to buy the one to get the other. They reason this way: Zirconium is consumed in the reactor and must be replaced; hafnium control rods last a long time. So they inventory the zirconium until it's needed to get the hafnium required now.

• **Outlook**—The metal will remain scarce for the foreseeable future—at least until applications are found for it that require large enough amounts to justify new, less costly production techniques. There's a substantial amount of the metal in the earth's crust, according to the U. S. Geological Survey.

1958 Mineral Value Down

The value of major minerals produced in 1958 was $16.4 billion, compared with $18.1 billion in 1957, says a Bureau of Mines preliminary report.

The nearly general decline in the mineral industries was attributed to lower demand, termination or slowing down of government stockpile purchases, withdrawals from inventories, and increased competition from foreign mineral producers.

Reactor Backlog Grows

Needs of the atomic age continue to unfold. Builders of reactors started 45 projects last year. Here are the developments to watch in 1959 and beyond

EARTH SATELLITES, missiles, and our A-plane fiasco dominated scientific news in 1958. In a less hectic period, our nuclear achievements would have made the headlines. The U. S. completed 37 reactors and started construction on 45 more in 1958, reports the Atomic Industrial Forum Inc., New York.

• **What's Ahead**—Here are several of the nuclear projects started in 1958:

Two reactors will produce electric power for distribution to consumers in Nebraska and Minnesota. North American Aviation Inc. is constructing a sodium graphite reactor at Hallam, Nebr., for operation by Consumers Public Power District of Nebraska. It's scheduled for completion in 1960. A boiling water reactor plant will be supplied by ACF Industries Inc. for operation by the Rural Cooperative Power Association of Elk River, Minn. It's to be completed in 1960.

A small pressurized power and space heat reactor built by Peter Kiewit Sons Co., will provide electricity and space heat for the Army Corps of Engineers at Ft. Greely, Alaska. The unit will be completed in 1960.

Westinghouse Electric Corp., Pittsburgh, has started to build 13 pressurized water reactors to propel one British and 12 American submarines.

General Electric Co. began construction last year on two pressurized water reactors for Naval vessels. One, at West Milton, N. Y., will serve as a prototype for the propulsion of a large destroyer; the second will be installed in a destroyer.

• **Foreign Projects** — American industry got contracts last year for the construction of reactors to produce electric power in Italy, Cuba, and West Germany. General Electric will build a plant by early 1963 at Punta Fiume, Italy. American Machine & Foundry Co., in partnership with Mitchell Engineering Ltd. of England, will build a plant at Santa Lucia, Cuba, for completion in 1961. General Electric will complete a plant in 1960 at Kahl, West Germany.

• **Old Business**—Projects started before 1958 and still under construction include:

A boiling water reactor built for Commonwealth Edison Co., which is scheduled for completion in 1959 or 1960. Site: Dresden, Ill. Builder: General Electric.

Babcock & Wilcox Co. is building a pressurized water reactor for Consolidated Edison Co. of New York. It will be completed in 1960. Site: Indian Point, N. Y.

Yankee Atomic Electric Co. will have a pressurized water reactor in 1960. It's being built by Westinghouse at Rowe, Mass.

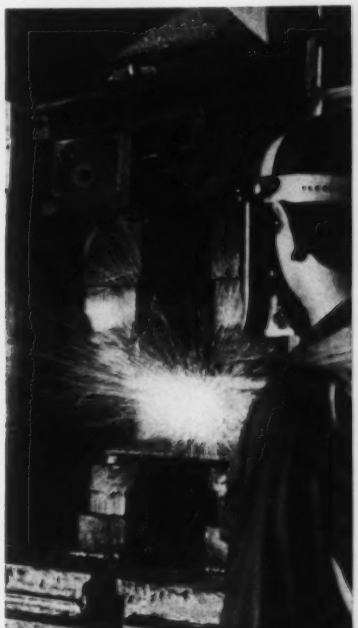
A fast neutron reactor is under construction by Power Reactor Development Co., for use by that firm. Completion date: 1960. Site: Lagoona Beach, Mich.

An experimental breeder reactor is being built by Argonne National Laboratory near Idaho Falls, Idaho. Completion date: 1960.

Westinghouse is producing and exporting components for a pressurized water reactor to be completed in 1959 at Mol, Belgium. In addition to orders received in 1958, that firm is building 11 pressurized water reactors for installation in submarines, eight more for an aircraft carrier, and two for a cruiser.

• **Other Advances**—Last year saw the completion of eight new uranium ore mills, the sale of at least 39 particle accelerators, the acquisition of large radiation sources by five industrial companies, the award of a contract to build a major facility for experimental preservation of food through irradiation, and the completion of two facilities for preparing nuclear reactor fuel.

A production line on wheels is formed by this 70 ton, all-steel welding-grinding car and its service units—rail-handling cars and a generating car which can develop auxiliary power when commercial power is not available. The entire operation requires a seven-man crew. The welder averages a completed joint every 4 minutes, producing a quarter-mile of continuous welded rail from 39 ft lengths in a little more than 2 hours



Following preheat cycles which bring metal to a plastic, molten stage, rail ends are squeezed together about 10 seconds under 30 tons of pressure, then struck with a hammerlike upset forging blow of 50 tons that forces foreign matter, gases, and surplus metal from the weld joint. The excess is sheared off and the joint is then ground smooth and tested

Railroads Lower Costs With Flash Buttwelding

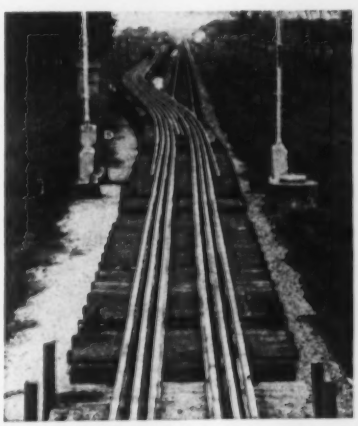
CHEMETRON Corp., Chicago, is making tracks with its electric, rail-welding system. "For the first time, railroads can produce and install continuous-welded rails for less than the cost of conventional bolted joint rails," says Robert A. Baer, head of the Rail Welding Dept. of Chemetron's National Cylinder Gas Div.

NCG's flash buttwelding unit spells doom for the "clickety clack" of train wheels passing over uneven rail joints—the weakest points in any track system. Welded joints may save U. S. railroads millions of dollars annually in track installation, in maintenance costs, and in reduction of damage to rolling stock and freight.

Mr. Baer says that U. S. railroads have wanted to install welded rails since the method was introduced almost 30 years ago. Surveys in the last five years by the American Railway Engineering Association show that the railroads save an average of $981 annually for every mile of welded track. It lasts longer and costs less to maintain, he claims.

NCG says the high cost of slower welding methods caused the railroads to balk at using welded rails except in tunnels, at grade crossings, or in station platform areas where track maintenance or replacement created a problem. Those areas constitute less than 1 per cent of the nation's rail mileage.

Chemetron obtained exclusive U. S. manufacturing rights to the automatic system from H. A. Schlatter Corp., Swiss producer of resistance welding machines. The first American-built system has been sold to the Southern Pacific Railroad and another has been under lease to the Great Northern Railway and the Louisville & Nashville Railroad



Quarter-mile track lengths travel on 34 flatcars from the welder to the installation site. Twelve miles of track can be transported at one time. Unloading is done by anchoring the rail ends and pulling the train out from under one or two rails at a time

Does 'Mechta' Alter Ike's Budget Plans?

ADMINISTRATION sources are maintaining a calm front despite Russia's sun orbiting missile. The National Aeronautics & Space Administration reports no change in U. S. plans and refuses to confirm or deny unofficial evaluations of the "Mechta" rocket—it may have twice the thrust of our Atlas. NASA states it cannot accept Tass as a reliable source of information.

No one denies that Russia outdid us by achieving escape velocity (roughly 25,000 mph). Our program to develop an engine with 1 million lb of thrust was announced last year. Presumably, it will be better than Russia's, but it is probably two years away. Communist scientists overpowered the earth's gravity with a cluster of rockets; our Titan may be capable of similar efforts, but it is just in its final series of tests (the first one failed in December).

Despite U. S. progress in 1958, we remain as far behind the Russians as we were when they launched Sputnik I in October, 1957, charge critics of Ike's budget policies. Pentagon sources have anticipated the President's detractors by announcing that more money at this time would not speed up our space programs too much. A broader research base is needed.

The U. S. is in the position of a corporation which is trying to expand its product line. It is impossible for Uncle Sam to spend much more money on new space techniques without creating a broader base from which to launch new experiments. Congress added about $1 billion to Ike's defense budget in fiscal 1959, yet the Pentagon will spend only a little of the money this year. To spend more would depend upon additional millions to keep the speeded up programs moving at an even pace. The Pentagon held back $600 million for Polaris launching submarines, $40 million for advanced Army weapons, $90 million for Minuteman, $50 million for Hound Dog, $50 million for jet tankers, $140 million for air cargo and troop carrying planes, and over $10 million for antisubmarine ships.

Those funds will be unfrozen in fiscal 1960, but Congressional sources expect spending in fiscal 1960 to be barely above fiscal 1959's $40.8 billion. This indicates severe cutbacks in other programs to allow the Pentagon to spend money on advanced projects at a rate no faster than indicated by the President's original budget for fiscal 1959.

Knowledgeable critics of our defense policies abhor the Congressional tendency to add money to programs almost as much as the White House does. They contend Congress must begin to add dollars farther back along the budget cycle—in basic research areas, for example—to give us a true speedup. Figuring an average five years' leadtime from research to weapon, it would take until fiscal 1965 before an additional $1 billion in our research budget of fiscal 1960 would create significant new weapons. Chances are that Congress will add funds to programs at this session. And it's an even bet that Ike will tell Pentagon budgeteers to freeze the extra funds again.

New Life for B-52 and B-58?

Bold Orion, a missile fired by medium or heavy bombers, has been tested at ranges of more than 1000 miles. Pentagon sources say its success spells new life for the mainstays of the Strategic Air Command, the B-52 (once scheduled to be out of production after 1960) and the B-58 (two weeks ago production was cut back 25 per cent). Now 100 more B-52s may be ordered to eventually boost SAC's strength to over 700, and 40 more B-58s may be added to the 26 already on order. Lockheed and Martin are both working on the Bold Orion, a late development of the Hound Dog.

Strategically, Bold Orion will do for the Air Force what Polaris will do for the Navy. Both will be launched over 1000 miles from their target, outside the range of Russian aircraft. The AF will claim its missile has as much potential as the Polaris because of the high speed of the launching aircraft. (Polaris launching submarines can hide from observers.)

Defense Firms' Subcontracting Slips

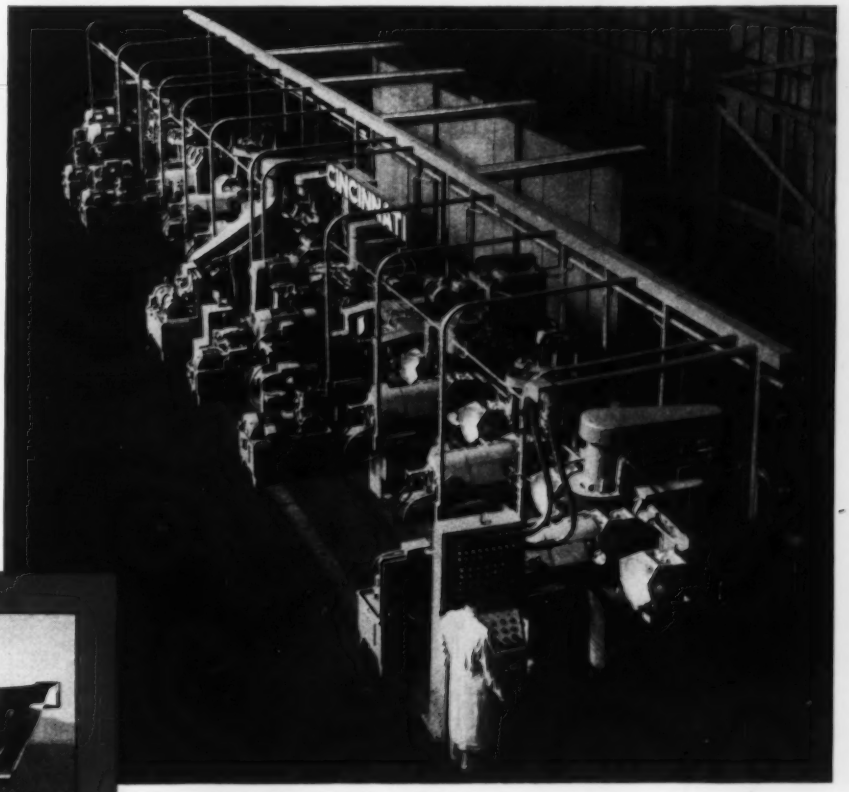
Large prime contractors of the Defense Department are subcontracting less work, and small business appears to be hit hardest. In the first half of fiscal 1957, large primes paid out 56 per cent of their military contract receipts to other firms, while in the last half of fiscal 1958, the figure was exactly 50 per cent. The share of small business dropped from 21.5 to 17.4 per cent. The figures are based on reports of over 250 large primes to the Defense Department. During the same periods, subcontracting among those primes also declined slightly, while total receipts from the Pentagon rose 5 per cent.

New Transportation Agency Is Rumored

Metalworking may have a big stake in a Washington agency reported in the planning stage. Some White House officials want all transportation agencies lumped together for easier administration and better planning. Included in the transfer would be Maritime Administration, Bureau of Public Roads, Civil Aeronautics Board, Interstate Commerce Commission, and our new Federal Aviation Agency.

Cincinnati 26-Station Unit Type Transfer Line

Mills, Drills, Bores . . . Ford Automatic Transmission Cases



At Ford Motor Company's new plant in Sharonville, Ohio, automatic transmission cases are automatically bored, milled and drilled in 33 machining operations. Accuracy and finish are excellent. The machine cycles 137 times per hour.

Inside the transmission case. Hard-to-reach surfaces are easily machined on

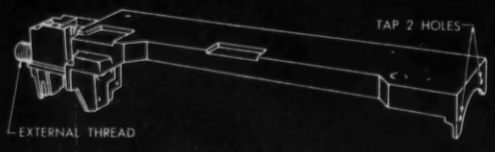
Transmission cases require gentle handling; firm, balanced clamping; experienced machining. All these requirements are incorporated in the CINCINNATI 26-Station Unit Type Transfer Line illustrated above. This production line mills, drills and bores Ford automatic transmission cases; inserts two bushings; automatically banks excess parts; transfers the casting from one station to the next. Several outstanding advantages are incorporated in this line, including unit construction and complete static electrical control. ¶Cincinnati builds special machine tools and complete production lines varying in complexity from small bearing-shell broaching machines to giant production lines performing a multitude of operations. Make Cincinnati your first choice for equipment of this type. Our Automation Specialists are ready to serve you.

SPECIAL MACHINE DIVISION
The Cincinnati Milling Machine Co.
Cincinnati 9, Ohio

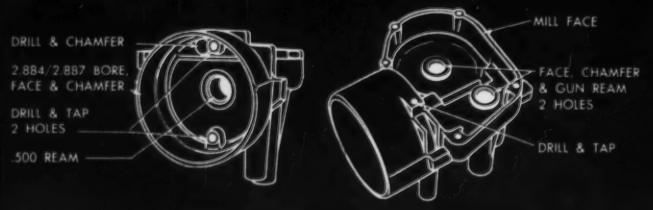
CINCINNATI®

SPECIAL MACHINES • VERTICAL AND HORIZONTAL
BROACHING MACHINES • COMPLETE PRODUCTION LINES

Ready to produce and produce and produce



SPEEDOMETER FRAME



WINDSHIELD WIPER HOUSING

These two machines are shown on our assembly floor ready to ship. One is a simple double-end machine with no indexing, the other a large center-column machine with indexing.

Both machines operate on die castings at high production rates. Both have power clamping and unclamping. Each operator removes a finished part, puts a new one in the fixture and presses buttons to clamp it.

The customers approved test runs here on our assembly floor. They continue to get good production because of good basic design and rugged, accurate construction.

Speedometer Frame 600 parts per hour is the gross production on the double-end machine (left) The left unit threads a stem with a self-opening die head while the right unit taps two holes. Another Kingsbury (not shown) operates on 11 holes in the same part.

Windshield Wiper Housing 460 parts per hour is the gross production on the big 13-spindle machine. A 43-inch index table holds seven work fixtures. The face to be milled is on top.

The first unit at the man's left mills the face at 3500 rpm. It is 30° right of the radial centerline through the station. For the holes in the center sketch there are four horizontal units, each 60° left of the radial centerlines.

Four vertical units operate on holes in the right sketch A combination tool machines the .500 hole and 2.884 bore concentric within .003 T.I.R

Special features include —

— Filtered coolant for all tools and gun reaming of two holes for a high finish.

— Oil mist lubrication for the multi-spindle auxiliary heads.

— Lights that identify any unit that fails to complete its cycle.

Little downtime, few rejects Our customers tell us that their Kingsburys run month after month without trouble. A Kingsbury can do the same for you. Kingsbury Machine Tool Corp., Keene, New Hampshire.

KINGSBURY

MULTI-UNIT AUTOMATICS

Advantages of Letters to Employees

THEY'RE PERSONAL . . . because they are addressed to the employee as an individual.

THEY INDICATE IMPORTANCE . . . because they are sent to the home.

THEY REACH THE FAMILY . . . because the message can be read by all members of the household.

THEY'RE FLEXIBLE, TIMELY . . . because they can be written at a moment's notice and updated to mailing time.

THEY'RE OFFICIAL . . . because they are a formal statement of the company's viewpoint and signed by the boss.

RESULTS: High readership and motivation.

Dear Boss: Letters Will Help Keep Your People Happier

YOU CAN go a long way toward keeping your work force happy for as little as 4 cents per employee.

The secret: Use letters as part of your employee relations program. The average unit cost is only 4 to 6 cents for large companies, 8 to 10 cents for medium and small firms, reports the U. S. Chamber of Commerce.

"Lack of information is one of the biggest factors in employee unrest. Letters to the home help alleviate such trouble. They are a worthwhile and successful activity," states R. S. Livingstone, vice president of human relations, Thompson Ramo Wooldridge Inc., Cleveland.

Letters cannot carry the entire employee relations load. House organs, newspapers, bulletin boards, mass meetings, information racks, posters, and supervisory letters all play an important role. But letters have advantages not offered by other media (see checklist).

• **What Can Be Said?**—"Employees cannot be coerced or intimidated on labor or politics, but we can and do present our side in an argument fairly," explains R. C. Wentz, manager of General Electric's communications and community relations, Large Lamp Dept. "Employees need it and welcome it as necessary information in reaching independent conclusions. Lawyers check our letters before mailings on controversial issues."

Charity drives, the business situation, company problems and changes are topics frequently covered. Many firms send a simplified yearend report to employees.

Mr. Livingstone adds: "We want our employees to have a clear understanding of our policies and practices, to make certain they know why things are done, and so that no one, inside or outside the organization, misinforms the employee about the company."

"Letter writing is usually left to those closest to the situation in our individual plants. We feel this is most effective," says Mr. Wentz.

• **Tips for Writing**—Overuse defeats impact. Wait until you have something to say. GE regards six per year as the minimum. Workers become accustomed to receiving letters from the plant.

A good employee letter contains three basic ingredients:

It's Complete: Stories are presented convincingly with complete facts, quotations, and testimony.

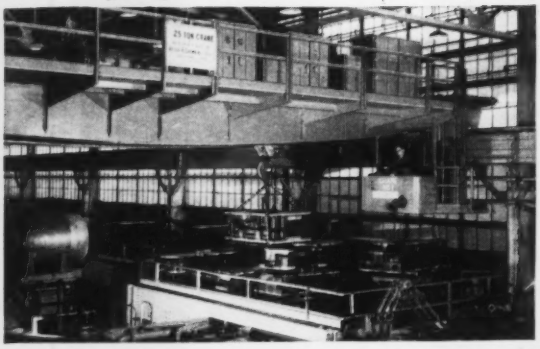
It's Clear: The writer, not the reader, should work. An easily read letter will be understood. Don't be afraid of definition. But avoid writing "down" to the reader. Stick to one topic per letter. Summarize.

It's Interesting: "What's in it for me?" is a normal reaction. The reader wants to know the facts of business in regard to his own interests and work experience.

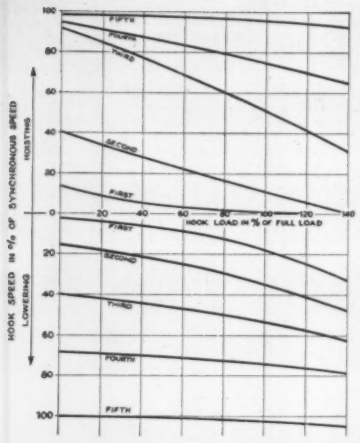
Glidden Revises Methods

The Chemicals - Pigments-Metals Div., Glidden Co., has revised its distribution methods in the west coast area. Effective Jan. 1, it started channeling all west coast activity through its own offices in the Los Angeles and San Francisco areas.

Here's Why Men in Command Specify



25-ton crane, equipped throughout with EC&M Control, gives excellent results in handling dies in automotive plant



Hook-speed curves tell the story! Nearly flat curves, regardless of load. Braking torque regulated from the simplest of magnetic amplifiers. No costly electronic tubes or complicated bias control involved

THE ELECTRIC CONTROLLER & MFG. CO.

A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 • OHIO

EC&M EDDYMAG* A-C Crane Control

ALL LOWERING SPEEDS SAFE because braking torque is automatically adjusted. Any tendency for the motor to speed up increases the eddybrake torque to insure safe lowering of all loads.

FAST RESPONSE enables the operator to "inch" loads accurately. Speed regulation is excellent, too. On first point, the empty hook starts down and the same point provides slow speed for "inching" heavy loads.

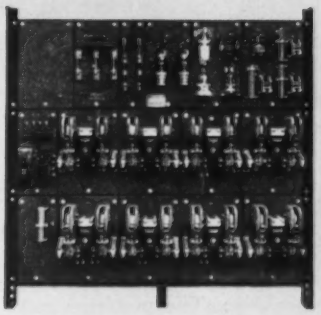
EASIER MAINTENANCE • All EC&M components are standard, mill-type construction—familiar to maintenance men, simple to work with, easy to understand.

SIMPLE CIRCUITRY • "EDDYMAG" Control uses no sensitive circuits—no tubes to balance. EC&M Frequency Relays, operating from the slip frequency of the motor, provide crane performance unequalled by other methods. Only one plugging relay and one set of acceleration relays required for smooth operation of the a-c wound-rotor motor-driven crane.

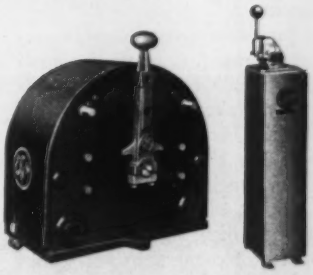
Join the men who know performance—specify EC&M Control for your next crane. For complete facts, write for Bulletin 6400

**EDDYMAG is an EC&M registered trademark*

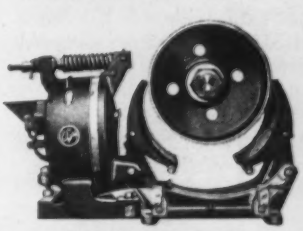
EC&M PERFORMANCE-PROVEN EQUIPMENT FOR CRANES



EC&M EDDYMAG Hoist Control uses mill-type contactors and relays—off-point braking helps stop the load



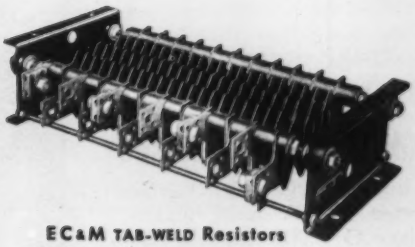
EC&M Master Switches—Cam or Vertical types—are compact, easy to operate



EC&M Type WB Brakes—100% lubricated—dirt can be flushed out

EC&M Manual-Magnetic Disconnect Switches provide a safe and convenient means for "killing" the crane

EC&M Youngstown Safety Limit Stops prevent over-hoisting accidents



EC&M TAB-WELD Resistors eliminate burning at the grid eyes and at the tap plates

9812

Wheeling Steel Will Make Strip

LOOK FOR the nation's tenth largest steel producer, Wheeling Steel Corp., Wheeling, W. Va., to become a more important factor in the industry.

Reason: It purchased sheet and strip mill facilities from Follansbee Steel Corp., Follansbee, W. Va. The mills have rated annual capacities of 150,000 net tons of cold rolled sheets.

Significance: The purchase puts Wheeling into the strip business and expands its sheet capacity. It enables the company to move into some new markets and to consolidate operations.

The purchase gives Wheeling an integrated operation in the Follansbee-Steubenville, Ohio, area. Wheeling has a coke producing operation, with 314 modern ovens, adjacent to the Follansbee mill facilities. Its steelmaking plant, employing 6500, is just across the river (in Steubenville).

Transfer of ownership will probably take place around April. The Follansbee facilities will be operated as a unit of the Steubenville Works. Ten of the open hearth stacks at Steubenville will be rebuilt under a $150,000 contract awarded to Youngstown Steel Tank Co., Youngstown.

Follansbee Steel, under its present management, will continue to make terne roofing products, blue steel, and other products.

ACF Shuts Buffalo Plant

ACF Industries will close its Nuclear Products-Erco Div. plant at Buffalo as soon as current contracts are completed. The plant includes six buildings, totaling about 150,000 sq ft.

Bonding Process Licensed

Kelsey Hayes Co., Detroit, signed a license with Fairchild Engine & Airplane Corp., Deer Park, N. Y., to use the patented Al-Fin molecular bonding process. The company will produce bimetallic integral wheel drums for Big Three passenger cars. The wheel drum is an integral cast aluminum wheel, hub, and drum bonded to a cast iron friction liner. It is said to meet the braking requirements of today's high powered automobiles.

Carbide Buys Texas Site

Union Carbide Corp., New York, has purchased facilities on a 306 acre tract at Brownsville, Tex.—it's the site of the former Amoco processing plant. The purchase includes the 42 mile Weslaco-Brownsville natural gas pipeline. It is the third chemical facility to be located in Texas by Union Carbide.

Zalk Forms New Division

A forging and manufacturing division to serve the upper Midwest has been formed by Zalk Steel & Supply Co., Minneapolis. It will specialize in eye bolts, U-bolts, punching, threading, bulldozing, upset forging, and bending supplies.

Enlarges Lab Facilities

American Brake Shoe Co., New York, has started construction of a $2 million research center at Columbus, Ohio. The laboratory will be used to expand present research facilities and for advanced research in hydraulics, electronics, and pneumatics.

GE Shifts Responsibility

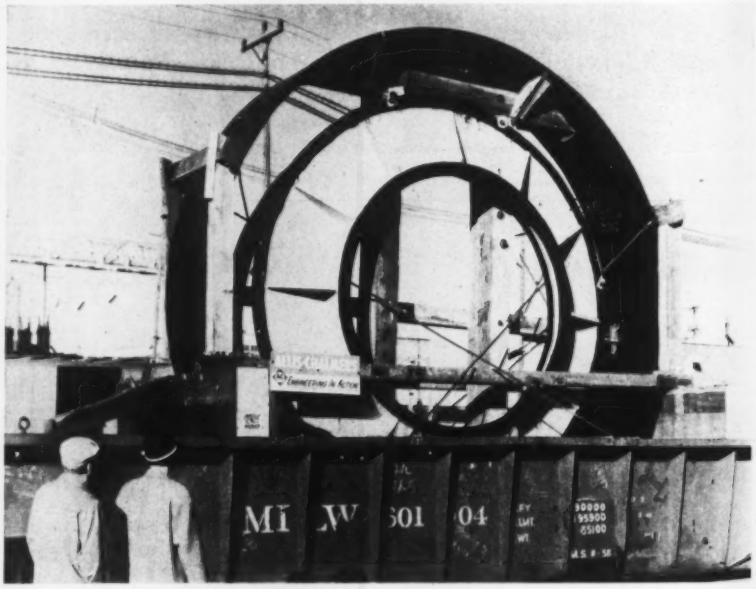
General Electric Co. has transfered responsibility for airborne and related rotating equipment to its Direct Current Motor & Generator Dept., Erie, Pa., from the Specialty Motor Dept., Ft. Wayne, Ind.

Renner Expands Plant

Renner Mfg. Co., Milwaukee, has completed a $170,000 expansion program. Plant space was increased 50 per cent. A 750 ton hydraulic press brake for bending heavy plates was installed. The firm makes heavy steel weldments.

Sonobond Corp. Formed

Aeroprojects Inc., West Chester, Pa., has formed Sonobond Corp., a subsidiary, to manufacture and sell ultrasonic metal joining equipment and to do production and sales engineering. The move separates research and production activities, enabling Aeroprojects to continue primarily as a research and development organization.



MOVING THIS HYDRAULIC TURBINE SHRINK BAND (about 19 x 19 ft) required special routing over 2200 miles of track on nine railroads. The king size part (made by Allis-Chalmers) will go into the Washington Water Power Co.'s hydroelectric plant in northwest Montana. It will clamp the turbine's three piece runner

Mining Firm Expands

Iron ore concentrating and pelletizing facilities enlarged by Humboldt Mining Co.

CLEVELAND-CLIFFS Iron Co. and Ford Motor Co., owners of Humboldt Mining Co., Marquette, Mich., are expanding Humboldt's facilities for mining and concentrating iron ore.

The multimillion dollar expansion program will double the mining firm's productive capacity. Installation of pelletizing equipment to produce high grade, marble sized pellets from ore concentrates will boost pellet production to 640,000 tons annually.

Addition of a second concentrating unit, similar to one already at the mining site, is planned. Full scale processing of hematite ores into pellets of 60 per cent or more iron is scheduled for mid-1960.

AA Gage Has New Service

A design engineering service, AA Industries, is offered by AA Gage Co., Detroit, a manufacturer of precision inspection equipment. The subsidiary will provide a single engineering source for any phase of a tooling program.

Sheffield Buys More Land

Sheffield Div., Armco Steel Corp., has purchased 86 acres adjoining its Blue Valley holdings at Kansas City, Mo. The land will be used for scrap metal storage and separation. The purchase is part of Sheffield's multimillion dollar expansion of production facilities.

Powerplant Site Chosen

The Air Force has selected Sundance, Wyo., as the site for a factory assembled, nuclear powerplant of modular design. Construction will begin in 1959.

Grumman To Build Lab

Grumman Aircraft Engineering Corp., Bethpage, N. Y., will build a $4 million avionics engineering laboratory at the company's Long Island facility. It will be completed by next fall.

The laboratory will house devices for the testing, evaluation, and development of avionic systems for aircraft, missiles, and space vehicles.

Electromet Expands Line

Electro Metallurgical Co., a division of Union Carbide Corp., will become a producer of industrial metal chemicals. Emphasis will be on chemical derivatives of less common metals.

Service Centers To Open

Eutectic Welding Alloys Corp., Flushing, N. Y., will spend over $1 million in 1959 to expand research, development, and technical service facilities. Four warehouse-service centers will be opened, the first in Boston this month. Other centers are scheduled for Baltimore, Philadelphia, and Vancouver, B. C.

The firm carries over 150 alloys, fluxes, and chemical aids used by industry for production and maintenance welding.

Chicago Tank Renamed

Solar Chicago is the new name for Chicago Steel Tank Co., division of U. S. Industries Inc. It was felt the old name had become misleading because of the firm's diversification.

NEW PLANTS

Canadian Baker Perkins Ltd., subsidiary of Baker Perkins Inc., Saginaw, Mich., has started an addition to its Brampton, Ont., plant. The firm manufactures food and chemical equipment.

Canadian Steelcase Co. Ltd., a subsidiary of Steelcase Inc., Grand Rapids, Mich., is completing an expansion program. It produces steel office furniture.

Consolidated Western Steel Div., U. S. Steel Corp., Maywood, Calif., is erecting engineering facilities.

Brush Beryllium Co., Cleveland, is expanding rolling mill and other facilities at its Elmore, Ohio, plant. Employment will be increased.

Kennecott Refining Corp. has started construction of an electrolytic copper refinery near Baltimore. The refinery will include equipment for casting wire bars and continuous casting of copper billets. The refinery is being engineered and built by M. W. Kellogg Co.

Owatonna Tool Co., Owatonna, Minn., has opened its 85,000 sq ft plant for the production of hydraulic maintenance tools.

Graham Mfg. Co., Batavia, N. Y., has leased the former Massey Ferguson Ltd. plant at Batavia. About 400 workers will be employed.

CONSOLIDATIONS

Vard Inc., Pasadena, Calif., and **Ideal-Aerosmith Inc.**, Hawthorne, Calif., are merging with **Royal Industries Inc.**, Los Angeles. Royal's manufacturing subsidiary, **Royal Jet** is also involved.

Joseph T. Ryerson & Son Inc., Chicago, a subsidiary of **Inland Steel Co.**, acquired **Vinson Steel & Aluminum Co.**, Dallas. Vinson is a steel and aluminum distributor.

Diversey Corp., Chicago, purchased **Deosan Ltd.**, London, England, manufacturer of chemical products and detergents for industrial use. Stock of Deosan will be owned by Diversey Corp. Ltd., England, a subsidiary of the U. S. company.

Greenlee Bros. & Co., Rockford, Ill., has acquired **Buss Machine Works** and its subsidiary **B&T Machinery Co.**, both of Holland, Mich.

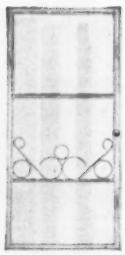
Waste King Corp., Los Angeles, is seeking to acquire **Cribben & Sexton Co.**, Chicago, through the purchase of common stock. Cribben & Sexton will be operated as an autonomous company with no staff changes.

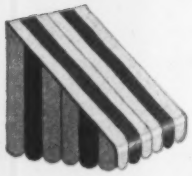
Dallas Tank Co. and **Trinity Steel Co.**, Dallas, steel fabricating firms, merged to form Trinity Steel Co. Inc.

Amchem Alodine...

EFFECTIVE

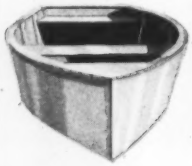
PROTECTIVE





PREPAINT

CONVERSION



COATINGS

FOR ALUMINUM

If you fabricate aluminum products—painted or unpainted—Amchem Alodine can provide you with an effective and protective chemical conversion coating process of remarkable characteristics.

The Amchem Alodine process forms an amorphous coating which becomes an integral part of the metal, enhances the natural corrosion resistance of the aluminum and provides an excellent bond for paint.

Alodine's simplicity, speed and economy as a prepaint treatment has gained widespread commercial acceptance in a wide variety of product applications.

Beyond product, Amchem provides the metalworking industry a complete service—processes, technical and engineering assistance, installation and instruction service—for corrosion protection, paint bonding, or other metalworking problems.

Write for complete information contained in Bulletin 1424A describing the uses of Amchem Alodine, as well as other literature pertinent to Amchem chemical conversion processes for the metalworking industry.

AMCHEM

AMCHEM ALODINE

Amchem Alodine is another chemical development of **Amchem Products, Inc.**, Ambler, Pa. • Formerly American Chemical Paint Company Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont./Amchem and Alodine are registered trademarks of Amchem Products, Inc.

Larger Inside — Smaller Outside

	1959 Rambler*	Car X	1959 Chevrolet†
Wheelbase	108 in.	110.5 in.	119 in.
Length	191.1	182.5	210.9
Height	58	57.5	56
Tread	58	56.5	60
Weight	2,951 lb	2,230 lb	3,610 lb
Front legroom	43 in.	46.5 in.	45 in.
Front headroom	36	37	36.1
Rear seat space	27.9	31	29.2
Rear headroom	35	36.5	34.3
Engine type	OHV 6 in line	V-6	OHV 6 in line
Horsepower	127/4,200	125/4,600	135/4,000
Axle ratio	3.31:1	3.74:1	3.36:1
Tires	6.40 x 15	6.40 x 14	7.50 x 14

*Rambler Six. †Biscayne.

Designer's Dream Car Beats Chevrolet for Room

IMAGINE you're an automotive design engineer. You want to design a light car that will be the envy of other engineers. It has to be smaller than today's cars yet just as roomy. It must be cheaper to make, but it can't be so radical that new manufacturing methods are needed.

To handle the assignment, you'd have to be an expert in chassis, engine, body, and transmission design. You'd also have to be in a position where your concept wouldn't be compromised by stylists, sales managers, and company executives.

Rod Hoffman, president, Hoffman Motor Developments Co., Detroit, can do the job. His latest light car design can be built with present technology and materials. It has as much seating capacity as Ford, Chevrolet, or Plymouth, is only slightly larger than the Rambler Six, and weighs 700 lb less.

Mr. Hoffman estimates his car will cost $400 less to build than the 1959 Chevrolet. This puts it in the league with the lighter cars the Big Three are planning to introduce for the 1960 model year. Mr. Hoffman's design involves methods of building engines, chassis, and transmissions that are unique, simple, and patented. For example, the car has a rear mounted, V-6 aluminum engine. It has a semiautomatic rear transmission. A unit body makes use of aluminum to cut weight; it employs steel where structural strength is required. Some of the components for the car have already been built. Others are likely to turn up on industry cars by 1961.

• **Who's Hoffman?**—Latter day automotive enthusiasts might not remember Mr. Hoffman, but he has been designing and building cars for 40 years. In the 1920s, he headed chassis design for Studebaker. He was chief design engineer for Packard during World War II. The Packard Clipper evolved under his direction. After the war, Mr. Hoffman directed Borg-Warner's research laboratories at Detroit.

Being an independent Hoosier (Purdue, 1911), Mr. Hoffman has set up his own consulting and design firm. His Detroit headquarters is a mecca for industry designers with problems. Between consulting jobs, his staff is kept busy finishing new design ideas. He has patented over 110 auto components.

• **Light Car Advocate**—Mr. Hoffman feels most at home in the field of lighter and smaller car designs. As he puts it: "When everybody else wanted bigger cars, I was designing smaller ones." Of his 71 engine designs, 20 are for aluminum jobs. He has built 22 aluminum engines, seven light cars.

As you see from the specifications (above), Mr. Hoffman's latest effort is 28 in. shorter than this year's Chevrolet, and 8.6 in. shorter than the Rambler. The car is rumored to be roomier than either of the forthcoming Ford or GM light cars.

Like most designers, Mr. Hoffman leaves appearance to the stylists. "How you bend sheet metal so it looks pretty isn't half so important as how you design the components that will carry the sheet metal around town," he asserts.

• **Aluminum Engine**—The light car

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

1959 Prospects Enthuse Industry

- **FORD MOTOR CO.** is more firmly convinced than ever that 1959 new car sales will bounce back to 1957 levels of 6 million units (including imports), says George P. Hitchings, company economist. Strengthening this forecast is the Ford Div.'s prediction that its dealers will sell 200,000 to 400,000 more Ford cars than they did in 1958—a maximum sales increase of $1 billion. J. O. Wright, division general manager, says Ford's Galaxie series is already accounting for one-third of the division's sales. January production schedules have been upped 15 per cent. Companywise, Ford expects to build 410,000 cars in the first quarter.

- **PARTMAKERS** are planning to cash in on the pickup. Harry Hirsch, president, C. M. Hall Lamp Co., thinks auto part sales will hit $3.3 billion in 1959, compared with $2.2 billion in 1958 and $2.7 billion in 1957. More confidence comes from GM's Saginaw (Mich.) Steering Gear Div., which reports it delivered 191,358 power steering units in December, 1958. W. H. Doerfner, general manager, claims it is the all-time high for monthly deliveries and 55 per cent over previous record months in 1955. More than 60 per cent of GM's 1959 cars are being equipped with power steering, against 47 per cent during the '58 model run.

- **FLEET SALES** should add to the auto pickup. Sales of cars for leasing and rental have been growing at a better than 10 per cent annual rate since 1954. American Motors Corp. reports Rambler fleet sales are running four times higher than they did a year ago. In 1958, AMC's fleet sales were 147.7 per cent over 1957's. Rambler six models accounted for 64 per cent of last year's company fleet sales. Rambler Americans garnered 24.2 per cent, while the larger Ramblers made up the remainder, reports W. B. Ramsey, AMC's director of government and fleet sales.

engine is rear mounted. It's a 6 cylinder, V block diecast job with a 3.625 in. bore and a 3.125 in. stroke. Displacement is 193.5 cu in., compared with 195.6 cu in. for AMC's six and 235.5 for the Chevrolet six. Cylinder walls are lined with 0.035 in. cast iron (particles).

Heads are aluminum, diecast in two pieces and bonded together when the engine is assembled. The engine is water cooled. The radiator is at the rear of the car.

• **Rear Transmission**—Part of the secret in keeping manufacturing costs down is to use present tooling and components. Many parts in Mr. Hoffman's semiautomatic transmission are in tractor transmissions.

The transmission is a four speed forward and reverse unit which uses two clutches. Mr. Hoffman explains its operation: "The clutches are actuated by oil pressure which eliminates the clutch pedal. There is a modulator which prevents the clutches from engaging rapidly when the engine is running at excessive speeds. This transmission is designed to permit rapid kickdown from fourth to third or from second to first. Second and fourth speeds are automatic. The only shifting is from neutral to reverse, neutral to low range, and low to high range."

Engine balancing is a tricky problem in designing cars. The transmission clutch and differential are mounted as a unit with the engine.

• **Flat Ride**—Front wheels are individually sprung. The entire wheel and brake assembly is diecast aluminum. Only the rim and wheel spindle are steel. The unsprung weight reduction permits drastic changes in springing a light car. Top suspension arms are attached to the body frame structure to prevent dive on braking.

"Rear suspension incorporates the same type of wheel structure and is of the swinging axle type," says Mr. Hoffman. The roll center of this suspension is 3.5 in. below the center line of the differential unit. Rear suspension geometry permits a slight cambering of the wheels on a turn and gives enough understeer so the centrifugal force of the car will neutralize tire drift on turns. It makes for flat cornering and no skid.

• **Unitized** — Mr. Hoffman's light car uses an integral body and frame structure of steel. Much of the structural strength is in the floor which is a sandwich design of simple steel stampings. Easy access tunnels are stamped into the floor so control cables, wiring harness, and hydraulic lines can be run through.

Door frames, doors, and deck lids are fabricated from aluminum to reduce weight. The car has a 7 in. road clearance and will weigh 2230 lb. A prototype costs $260.000.

Guide To Car Size Terms

Detroit has been having word trouble in distinguishing among small, smaller, and economy automobiles. Much of the confusion has arisen since Ford, Chevrolet, and Plymouth have taken to calling some of their models "economy" cars. Here's an unofficial sizing guide many members of motordom are using: "Tiny"—Vehicles like Isetta and Metropolitan. "Small"—Wheelbases around 100 in. "Light"—Wheelbases between 105-112 in. "Economy" relates to price and performance, not size. Sports cars are not included in this guide.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	641,519
February	392,112	570,650
March	357,049	578,356
April	316,503	548,656
May	349,474	531,413
June	337,355	500,266
July	321,053	495,625
August	180,324	524,363
September	130,426	283,862
October	261,696	327,362
November	514,099	578,600
December	595,000†	534,714
Totals	4,244,448†	6,115,458

Week Ended	1958	1957
Dec. 6	147,361	139,506
Dec. 13	137,882	145,503
Dec. 20	135,964	140,447
Dec. 27	104,907	79,945
Jan. 3	97,819†	76,653
Jan. 10	145,000*	120,140

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

ARISTOLOY

Electric Furnace Steels

BEARING QUALITY • AIRCRAFT • PISTON PIN QUALITY • ELECTRIC FURNACE ALLOY • ELECTRIC FURNACE CARBON • ALLOY BASE ALLOY • QUALITY CARBON

LEADED*—Electric Furnace 52100 • Electric Furnace Alloy • Electric Furnace Carbon • Alloy Base Alloy • Quality Carbon.

STAINLESS—300 Series • 400 Series • 500 Series.

FURNISHED AS—Hot Rolled Blooms, Billets & Bars • Hot Rolled, Annealed & Heat Treated • Ground Blooms & Billets • Bars—Hot Rolled; Turned; Turned, Ground & Polished; or Cold Drawn with or without Heat Treatment.

*Inland Ledloy License

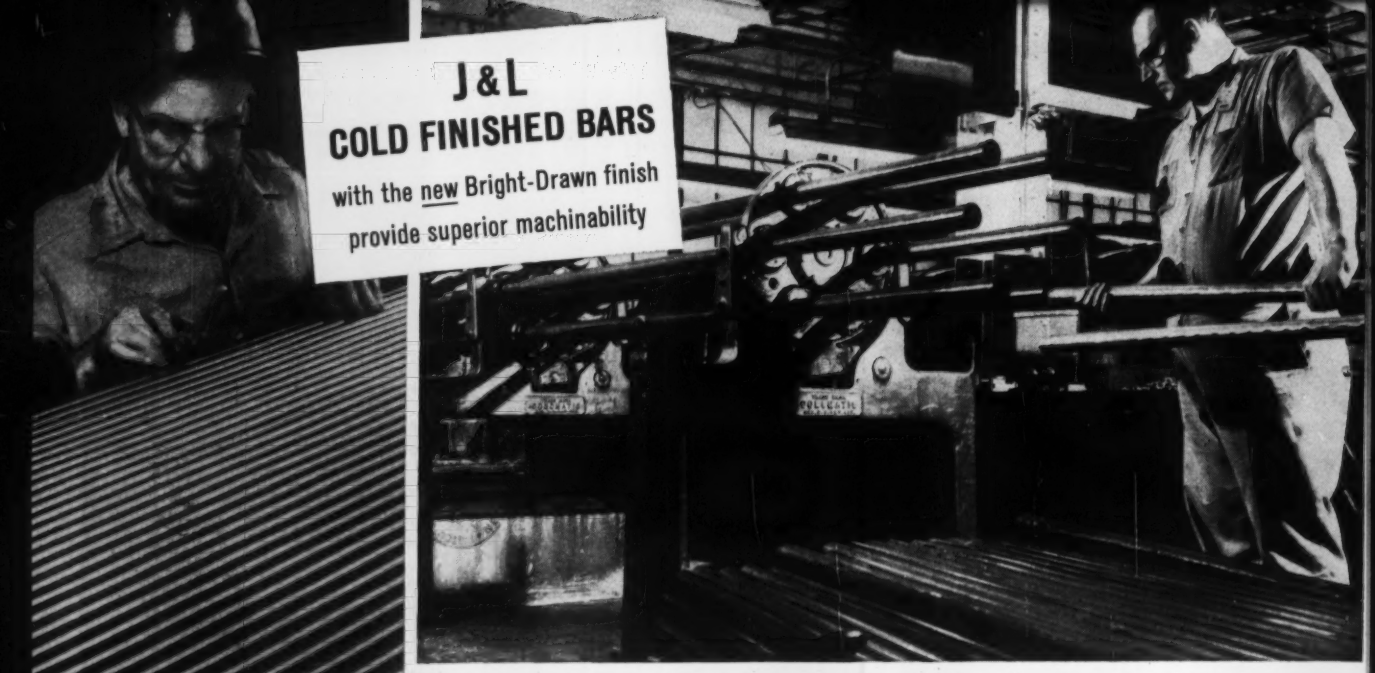
NEW PRODUCTS & FACILITIES CATALOG

Describes melting, rolling, thermal treating and finishing capacity of Copperweld's Aristoloy Steel Division. Complete product listing for Aristoloy carbon, alloy, stainless, leaded and nitriding steels. Send for your copy today.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4005 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.



J&L's B-1113 leaded steel permits 35% higher machining speeds in this multiple spindle screw machine operation at Singer Manufacturing Co., Elizabethport, N. J.

"J&L B-1113 leaded steel provides flawless finish, speeds machining of Singer sewing machine parts 35%"

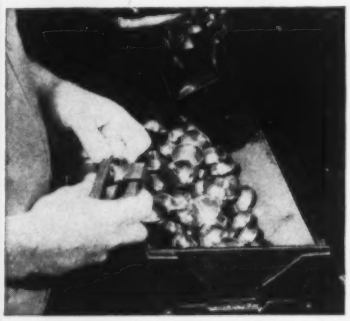
"Flawless finish of 'Slant-O-Matic' hook assembly components machined from J&L B-1113 leaded steels and carefully polished prevents thread snags," according to officials of Singer Manufacturing Company.

With the "Slant-O-Matic" hook assembly moving at 3200 revolutions a minute, the slightest burr or tool mark on any part would snag the thread. Singer officials report the machined surfaces with J&L steel are "definitely easier to polish." They are now using leaded steel in over 100 components on the scores of industrial and household machines they manufacture.

"Use of cold finished leaded steel bars also speeds production 35% on our multiple spindle screw machines. And we get 25% longer tool life," Singer officials report.

Similar machining qualities and speed are possible in your operations with J&L controlled quality cold finished steel bars. A J&L steel specialist can recommend exactly the right steel for any job from J&L's complete cold finished line. Chances are he can help you get improved finishes, higher cutting speeds and longer tool life.

Call your local distributor or write to Jones & Laughlin Steel Corporation, Dept. 404B, 3 Gateway Center, Pittsburgh 30, Pa.

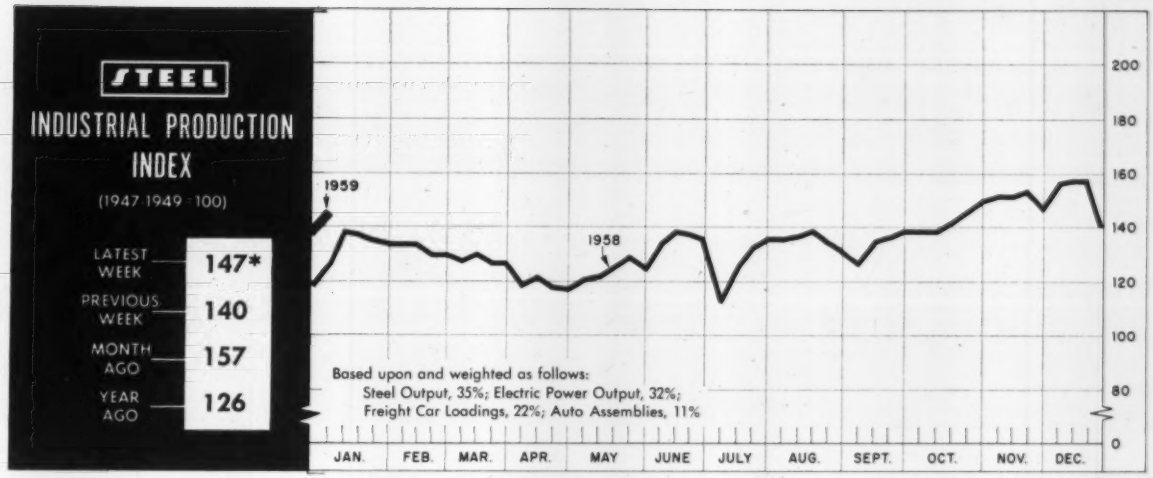


The superior surface finish on hook assembly components prevents thread snags. Parts are machined from J&L leaded steel bars with the improved new Bright-Drawn finish.

J&L STEEL

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA



*Week ended Jan. 3.

First Half To Set Fast Pace

BUSINESS is taking up right where it left off at the end of 1958 when it was climbing to prerecession levels. And there is little doubt that the goal will be reached during the next six months.

STEEL's industrial production index (above) rebounded sharply from the holiday slump. All four components showed signs of renewed strength. The most encouraging news so far in 1959 comes from the steel industry, which scheduled its operations last week at the highest level since early in October. Steelmen aimed at 2,109,000 net tons for ingots and castings. Figured on the basis of the new weekly capacity of 2,831,486 tons, the rate is 74.5 per cent of capacity. Figured on the old basis, it is 78.2 per cent.

• **More of Same**—You can expect the steel industry to maintain such a pace for some time. Most steel officials believe that operations will average better than 75 per cent during the first half. Consumption of many big steel users will be appreciably above what it was in 1958.

The auto industry is scheduling output of 595,000 units in January, equaling the December rate, says *Ward's Automotive Reports.*

Joseph F. Miller, managing director of the National Electrical Manufacturers Association, predicts the electrical manufacturing industry will produce $21 billion worth of goods this year, up 7 per cent from last year's mark.

The canmaking industry will post another 2 per cent gain during 1959, predicts William C. Stolk, president of American Can Co.

Construction is expected to increase 3 to 7 per cent.

Even the railroads, which have been showing signs of renewed activity lately, are expected to get into the act by ordering more freight cars this year.

• **Building Stocks** — Consumption

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,109[1]	2,058	1,515
Electric Power Distributed (million kw-hr)	12,800[1]	12,379	11,692
Bituminous Coal Output (1,000 tons)	5,890[1]	8,895	5,843
Crude Oil Production (daily avg—1,000 bbl)	7,000[1]	7,129	6,863
Construction Volume (*ENR*—millions)	$273.2	$307.6	$259.3
Auto, Truck Output, U. S., Canada (*Ward's*)	118,190[1]	126,364	93,416
TRADE			
Freight Carloadings (1,000 Cars)	475[1]	432	472
Business Failures (Dun & Bradstreet)	185	251	166
Currency in Circulation (millions)[3]	$32,456	$32,533	$31,959
Dept. Store Sales (changes from year ago)[3]	+3%	+3%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,276	$26,065	$20,937
Federal Gross Debt (billions)	$282.2	$282.9	$275.1
Bond Volume, NYSE (millions)	$23.6	$17.7	$21.0
Stocks Sales, NYSE (thousands of shares)	15,041	8,944	13,067
Loans and Investments (billions)[4]	$95.9	$96.0	$88.5
U. S. Govt. Obligations Held (billions)[4]	$31.9	$31.9	$26.1
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	216.9	217.4	206.4
All Commodities[7]	119.3	119.2	118.4
Commodities Other than Farm & Foods[7]	127.2	127.2	125.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

Coming Jan. 19

IN

STEEL

Explosive Forming: Why It Works

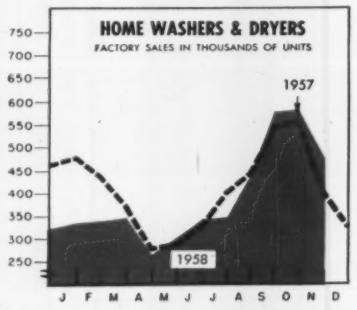
On Jan. 19, STEEL will present the opinions of three leading authorities about what goes on behind the scenes in explosive forming. It is the first major article on explosive technology to appear since "Explosives Form Space Age Shapes" (STEEL, Aug. 25, 1958, p. 82) hit management's desks.

STEEL's article will provide some answers for many skeptics. Some typical questions we've heard: How can an explosion make metal harder without changing grain structure? How is it possible to get greater elongation than with any other method? With such unbelievable pressures (1 million psi plus), why doesn't the metal fracture?

Although admittedly pioneers, the experts will point to many well-known, fundamental laws governing explosive forces and their effects on metal structures. An enormous amount of groundwork (or should we call it "waterwork"?) has been done by the Navy in studying the effects of underwater explosions. Metal forming is partly an outgrowth of that work.

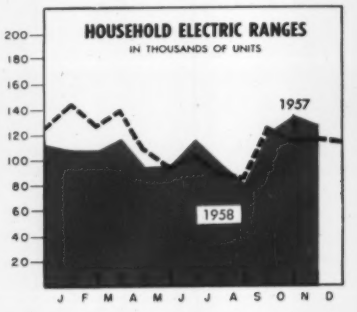
To help you keep abreast of this important development, STEEL will offer extra copies until the supply is exhausted. (Sorry, but we haven't any copies left of the Aug. 25 story. Better order your copies of the Jan. 19 article now, so you don't miss out.) Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

THE BUSINESS TREND



	Washers 1958	Washers 1957	Dryers 1958	Dryers 1957
Jan.	238,153	331,314	98,630	144,621
Feb.	263,099	319,580	78,578	114,517
Mar.	278,891	286,205	70,309	83,668
Apr.	224,896	230,675	38,475	42,850
May	262,999	262,430	41,898	32,846
June	288,831	289,245	54,173	47,696
July	277,287	340,915	75,513	70,440
Aug.	326,785	329,146	109,833	117,055
Sept.	423,073	392,733	158,733	166,473
Oct.	404,056	377,621	180,405	185,772
Nov.	333,035	260,460	142,499	141,663
Dec.	.....	206,787	.....	118,116
Totals	 3,627,111		 1,265,717	

American Home Laundry Mfrs. Assn.



	Total Factory Sales—Units 1958	1957	1956
Jan.	109,000	144,500	143,600
Feb.	108,700	127,700	161,400
Mar.	117,900	139,400	163,100
Apr.	95,600	107,200	157,500
May	96,000	93,600	128,400
June	116,800	102,300	129,800
July	98,500	88,700	121,500
Aug.	81,400	85,800	97,500
Sept.	122,200	124,800	129,300
Oct.	135,700	120,400	116,200
Nov.	129,300	116,800	110,200
Dec.	.....	113,800	126,500
Totals ...	.....	1,365,000	1,585,000

National Electrical Mfrs. Assn.

Charts copyright, 1959, STEEL.

isn't the whole story. Economists say one of the biggest factors in this year's success story will be inventory accumulation, which will be more applicable to steel users than to many other businessmen. Partmakers tell STEEL that fears of a steel strike in mid-1959 are causing them to take another look at their raw material stocks. (See Page 33.) Both factors may push the steel industry's operating rate considerably higher before late June.

RR Business Perking Up

Almost as encouraging is the news from the railroad industry. Freight carloadings during the latest week of record (ended Dec. 27) finally pulled ahead of the year-ago period for the first time since Aug. 17, 1957, exclaims the Association of American Railroads. And for the first time in many months, the 13 Regional Shippers Advisory Boards anticipate an increase for the current quarter over the corresponding year-ago period. (The improvement will come to 5.9 per cent, they believe.)

Remember that the general trend in business during the first quarter of 1959 is expected to be up while the trend in the same period last year was down. Daniel P. Loomis, president of the association, feels that the year "will show gradual improvement, with perhaps substantial improvement in the last half."

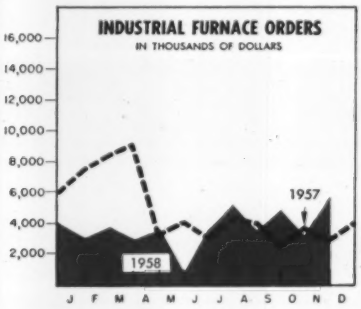
Motordom Finds Its Niche

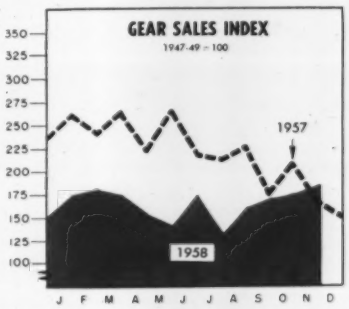
Adding further strength to the industrial picture is automotive production, which is finally in high gear. January will be the first month since last summer in which output will not be cut back because of a major strike. The industry expects to equal or exceed December's mark of 595,000 units. That's an improvement of more than 100,000 units over the January, 1958, figure.

Much of the optimism expressed in STEEL's component survey (Page 33) can be traced to the strong and steady pace in motordom. For that reason, the auto industry is on the spot in 1959. If it falls short of its goal of 5.5 million cars, the moans and groans from metalworking will be long and loud.

Appliance Outlook Good

Appliance makers are sharing the spotlight with auto producers, although a few component makers feel





	1958	1957*	1956*
Jan.	3,045	7,380	10,244
Feb.	3,684	8,373	12,163
Mar.	2,871	9,090	7,025
Apr.	3,572	3,164	8,803
May	953	3,994	3,667
June	3,672	2,974	4,748
July	5,169	4,332	4,140
Aug.	3,533	3,924	6,722
Sept.	4,846	2,337	3,057
Oct.	3,105	3,621	8,741
Nov.	5,597	2,832	3,986
Dec.	....	3,992	5,858

*Not including new orders for steel mill furnaces.
Industrial Heating Equipment Assn. Inc.

	1958	1957	1956	1955
Jan.	174.5	259.3	245.5	140.9
Feb.	179.1	239.5	256.2	148.5
Mar.	173.7	262.4	276.5	172.8
Apr.	153.2	221.7	264.7	179.8
May	142.2	263.2	275.6	205.2
June	173.8	215.9	245.4	193.5
July	133.3	211.4	286.7	201.7
Aug.	162.1	225.8	219.5	217.6
Sept.	170.7	174.9	230.5	246.5
Oct.	175.9	207.0	299.8	227.6
Nov.	182.7	165.3	216.2	210.4
Dec.	....	150.8	235.7	245.5
Avg	....	216.4	254.4	198.3

American Gear Mfrs. Assn.

that there is more optimism in this area than sales justify. Part of this attitude may be traced to the seasonal downturn experienced by this industry in midwinter. (See tables and graphs, Page 56, for the trends in home laundry equipment and electric ranges.)

But producers of household goods are touting 1959 as the big comeback year. In home laundry equipment, the hot item is going to be washer-dryers, says Parker H. Ericksen, vice president and general manager of Easy Laundry Appliances Div. of Murray Corp. of America. Sales of 250,000 units this year will be a big step toward the five-year goal of 1 million units.

Ross D. Siragusa, president of Admiral Corp., believes that home freezers are going to be a big item in '59. Admiral officials feel this will be a good year for all appliances because of three factors: 1. The replacement market. 2. The anticipated rise in home construction and remodeling. 3. The public's intention to purchase as shown by recent surveys. (See STEEL, Dec. 8, 1958, p. 85.)

The electronics industry established another sales record in 1958, reaching $7.7 billion (factory sales) despite a decline in consumer items, reports David R. Hull, president of the Electronic Industries Association. He predicts that the industry will push on to higher levels in 1959, reaching sales of $8.3 billion, with all segments of the industry contributing to the gain.

Business Above Year Ago

Reports from most segments of metalworking are falling into a pattern: Business better than it was a year ago, but not up to the record levels of 1956-57. Here are some recent examples:

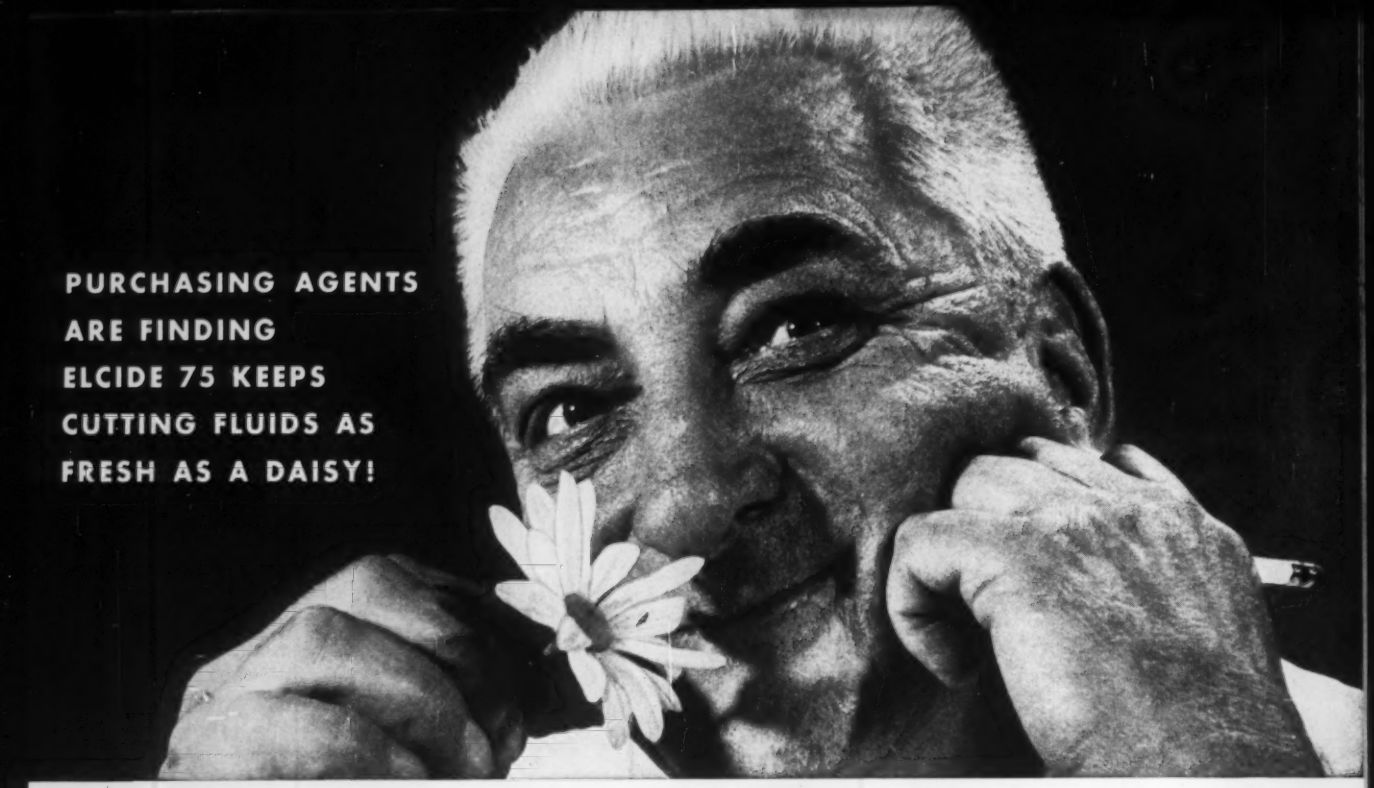
November bookings of members of the American Institute of Steel Construction Inc. were 242,635 tons, down 7 per cent from the previous month but 11 per cent above the November, 1957, figure.

New orders for industrial furnaces in November totaled $5,597,000, up 80 per cent from October and well above the year-ago total. But November was far from the best months (see table and graph above.)

The sales index of the American Gear Manufacturers Association climbed to 182.7 (1947-49 = 100) in November, the highest point of the year but still considerably below the best months of 1957 (see table and graph above).

"Samson" Shot
(chilled iron)
"Angular" Grit
ANGULAR GRIT
AMERICA'S LEADING METAL ABRASIVES
The four most famous names in metal abrasives provide a size and type of shot or grit to meet every blast-cleaning need. Write for literature and recommendations.
PITTSBURGH CRUSHED STEEL CO.
Arsenal Sta., Pittsburgh 1, Pa.
MALLEABRASIVE
MALLEABLIZED SHOT and GRIT
SSP
TRU-STEEL SHOT
TRU-STEEL
HIGH CARBON STEEL SHOT

ALIVE TODAY!
Arch Lightbody is one of 800,000 Americans cured of cancer because they went to their doctors in time. They learned that many cancers are curable if detected early and treated promptly. That's why an annual health checkup is your best cancer insurance.
American Cancer Society



ELCIDE 75™ extends the life of soluble oil emulsions

. . . lowers operating costs three ways

Less oil concentrate is purchased because standard duty emulsions last far longer when treated with one ounce of Elcide 75 per four gallons of emulsion.

Labor costs are reduced because less non-productive time is spent recharging machinery. The labor costs of disposal also decrease because there is much less waste-oil to be handled.

Production increases because machines are not shut down as often. Elcide 75 also contributes to better products and longer machine tool life by controlling the bacteria that may cause staining and corrosion. Employee efficiency improves, too, because Elcide 75 eliminates odor and controls bacteria that can cause skin infections.

Elcide 75 is more effective than other inhibitors because it is a combination of antibacterial agents, and includes a powerful new compound related to one of the safest, most effective bacterial inhibitors used in medical surgery. This combination controls a wider range of bacteria, including certain types that were resistant to commonly used germicides.

Elcide 75 controls harmful bacteria . . .

This photomicrograph shows one type of bacteria that enter emulsions through the air, water, and plant debris. They multiply rapidly and cause odor, staining, corrosion, and emulsion breakdown. Their damage costs the metalworking industry thousands of dollars each year.

Elcide 75 specifications: *Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium o-phenylphenate. Price per gallon—1 gallon (4 per case), polyethylene, $8.50; 5 gals., polyethylene, $8.00; 55 gals., stainless steel, $6.50. Sold only through selected distributors. For more information or to place your order, phone or write:*

ELCIDE 75™

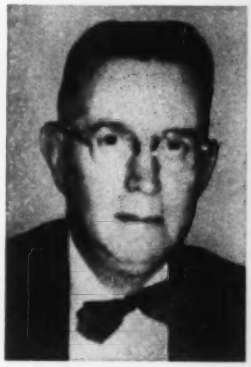
PATENT PENDING

Lilly

Lilly's brand of bacterial inhibitor for cutting fluids

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA. TELEPHONE: MELROSE 6-2211

MARTIN H. OLSTAD
Niagara Blower president



F. L. CAMERON
Park Drop Forge p.a.

WILLIAM R. MOGG
Crucible-Spring Div. sales

JOHN TOWERS JR.
U. S. Metals Refining post

Martin H. Olstad was elected president, **Niagara Blower Co.**, New York. He was vice president. **Paul H. Schoepflin**, former president, was elected to the new post of chairman and chief administrative officer.

F. L. Cameron, former assistant purchasing agent, was made purchasing agent of **Park Drop Forge Co.**, Cleveland. He replaces **J. W. Grinder**, retired. **P. T. Glaser** was named assistant purchasing agent.

Frank Graziano, assistant manufacturing vice president, was elected manufacturing vice president of **Monarch Machine Tool Co.**, Sidney, Ohio. He succeeds **Alfred Sherman**, who becomes consulting vice president until his retirement in June. **Louis Kritzer** was made general superintendent.

Floyd R. Anderson was named chief metallurgist, **Gardner-Denver Co.**, Quincy, Ill. He was administrative assistant of the Denver Div., and now supervises metallurgical operations of all company divisions, domestic and foreign.

Russell S. Kenerson was elected president, **Thompson Products Ltd.**, St. Catharines, Ont., a subsidiary of Thompson Ramo Wooldridge Inc. He succeeds **George A. Stauffer**, named chairman.

William V. Covert, chief engineer, **Diamond Chain Co.**, Indianapolis, subsidiary of **American Steel Foundries**, transfers to the general office of the parent company in Chicago as assistant vice president.

William R. Mogg was appointed sales manager at **Crucible Steel Co.'s** Spring Div., Pittsburgh. He was sales manager of special products at Cleveland Graphite Bronze Co., Cleveland, a division of Clevite Corp.

Consolidated Western Steel Div., U. S. Steel Corp., appointed **W. A. Saylor** chief metallurgist; **W. A. Box**, general supervisor-design engineering; **W. I. Ballentine Jr.**, general supervisor-research and development services. They are at the division's home office (Maywood Plant, Los Angeles) in the recently established research and development section, which will occupy laboratory and office space in the firm's new engineering and development facility, due for completion this month.

Robert F. Schutz was elected executive vice president and made manager of the **Ingersoll-Kalamazoo Div.**, Kalamazoo, Mich., Borg-Warner Corp. Other division appointments: **Ben A. Swennes**, named vice president and director of engineering; **Anthony S. Mrozek**, vice president-defense sales.

Inland Container Corp., Indianapolis, appointed **Walter G. Koch** a vice president. For many years, he was president and chairman of International Steel Co., Evansville, Ind.

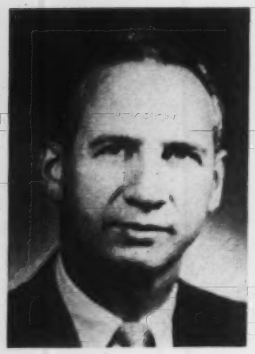
Esmonde J. Bushey was named works manager, **Athol Div.**, Athol, Mass., Union Twist Drill Co. He succeeds **George W. Grover Sr.**, retired.

John Towers Jr. was made manager of the Carteret, N. J., plant of **U. S. Metals Refining Co.**, subsidiary of American Metal Climax Inc. He succeeds **Freeman H. Dyke**, retired. Mr. Towers joined the firm in 1949. He was named general superintendent of smelting and refining in 1956, and for the last year served as manager of operations.

Edward McL. Tittmann was elected a vice president, **American Smelting & Refining Co.**, New York. He is in charge of Asarco's smelting and refining operations. In addition, he continues as chairman and chief executive officer of Southern Peru Copper Corp., in which Asarco holds a majority interest.

Richard B. Fuller joined **Stanley Aviation Corp.**, Denver, as director of purchases. He was associate director of purchases for Thompson Ramo Wooldridge Corp.

Daniel T. Warner, president, and **William R. Clements**, sales vice president of **Master Electric Co.**, division in Dayton, Ohio, of Reliance Electric & Engineering Co., have retired. **Walter H. Haber**, a vice president of Reliance at headquarters in Cleveland, has direct responsibility for operations of Master Electric, and appointed **John E. Walker** assistant division manager. **George A. Goodwin** continues as works manager; **Ted H. Nelson** as manager of engineering. Two new departments were created for which **Robert L. Wolfe** was made manager of product development; **James E. Stahl**, product manager for mar-



HOWARD R. JOHNSON MELVIN L. ZUEHLKE
general managers at Eaton's Michigan divisions

K. R. CHANDLER WILLIAM B. DICKERSON
Koehring Div. sales positions

keting gear motors, fractional horsepower motors, and brakes.

Eaton Mfg. Co. appointed **Howard R. Johnson** and **Melvin L. Zuehlke** general managers of their respective divisions. Mr. Johnson, assistant general manager, Valve Div., Battle Creek, Mich., succeeds **Harold I. Dyer**, who retires as general manager, but continues with Eaton in an advisory capacity to the new Brazilian subsidiary. Mr. Zuehlke, assistant general manager, Saginaw, Mich., Div., succeeds **H. F. Russell**, retired general manager.

Wheeling Steel Corp., Wheeling, W. Va., appointed two assistant vice presidents. **Albert H. Shonkwiler** becomes assistant vice president-Operations Div., in charge of operational planning. **Leslie Irvine**, general manager of sales, becomes assistant vice president-Sales Div. Mr. Shonkwiler is succeeded as general manager of the Steubenville, Ohio, Works by **H. Nelson Lang**, who was general manager of the Benwood, W. Va., Works.

Benwood, W. Va., Works. **Nelson W. Blakely** was appointed general manager of the Benwood Works. He was assistant general manager.

Floyd S. Eckhardt, an assistant general manager of the Lackawanna, N. Y., plant of **Bethlehem Steel Co.**, was made an assistant to vice president of Bethlehem's Steel Div., Bethlehem, Pa. He is succeeded by **Robert H. Meyer**, former coke ovens superintendent at Lackawanna, who is replaced by **James C. McCord**.

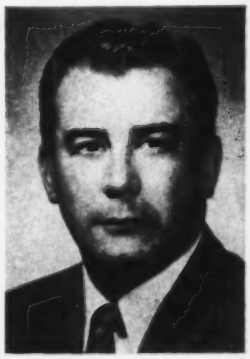
Stainless & Strip Div., **Jones & Laughlin Steel Corp.**, named **Russell H. Loutzenhiser** division vice president-production; and **Eugene V. Mort**, division general manager-production. Mr. Loutzenhiser was in charge of production at the division's Detroit and Louisville, Ohio, plants. He continues headquarters in Detroit. Mr. Mort was manager of production, strip producing plants. He will devote his time to the Louisville, Ohio, and strip producing operations, with emphasis on Louisville.

K. R. Chandler was promoted from assistant sales manager to the new post of assistant vice president-sales, **Koehring Div.**, Koehring Co., Milwaukee. **William B. Dickerson** was made sales manager.

John L. Derby was made executive vice president, **Scaife Co.**, Oakmont, Pa., subsidiary of Wilson Bros. Inc. He directs sales, engineering, and production.

Keith T. Middleton and **Richard F. Cooper** were elected administrative vice presidents, **Fafnir Bearing Co.**, New Britain, Conn. Mr. Middleton, who retains the office of secretary, was vice president and secretary-treasurer. Mr. Cooper was vice president-manufacturing, and now co-ordinates manufacturing, sales, and engineering divisions, and other special assignments. **Robert W. Powell**, general sales manager, was elected vice president-sales to succeed **Charles F. Stanley**, retired. **Franklin S. Atwater**, general works manager, succeeds Mr. Cooper as vice president-manufacturing. **Ran-**

ALBERT H. SHONKWILER LESLIE IRVINE
assistant vice presidents at Wheeling Steel



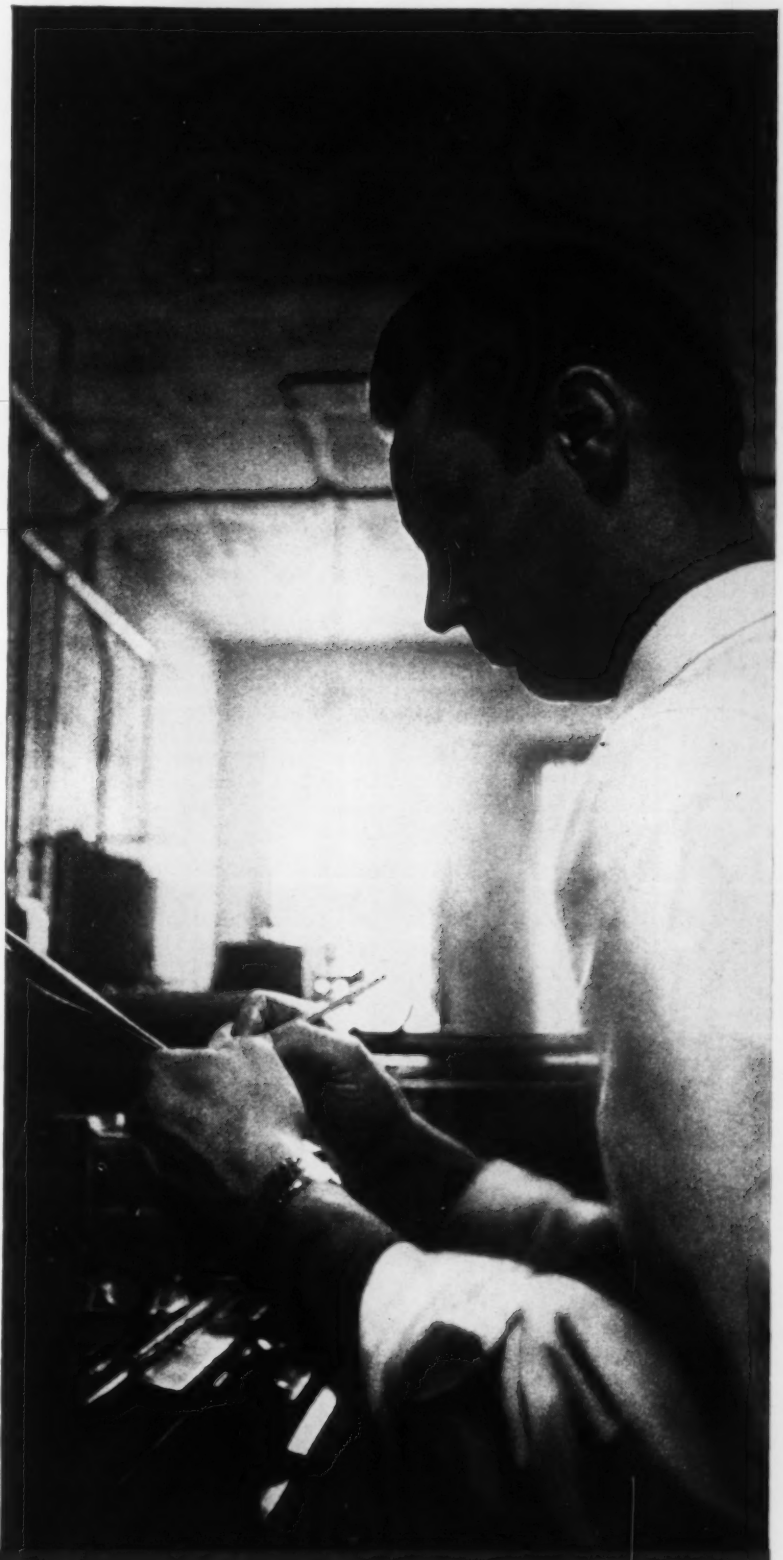
RUSSELL H. LOUTZENHISER EUGENE V. MORT
J&L Stainless & Strip Div. posts

HERE'S HOW ESSO RESEARCH CAN GO TO WORK FOR YOU

The Esso Lubrication Engineer brings to your shop the vast experience and facilities of Esso laboratories and research—as a customer service.

He offers, with a broad knowledge of fuels and lubricants, considerable experience in the maintenance of equipment like yours. For instance, he can trouble-shoot cases of rapid wear and frequent overhauls... point out instances where too much lubrication is wasteful... where too little—or the wrong kind—results in unnecessary wear. And if you have an unusual problem, he can have it analyzed in one of the conveniently located Esso Sales Service Laboratories—capable of running over 500 different kinds of petroleum product tests.

Let an Esso Lubrication Engineer help *you* cut maintenance costs. For more information, contact your nearest Esso office, or write to: Esso Standard Oil Company, 15 West 51st Street, New York 19, N.Y.



Esso

In industry after industry..."ESSO RESEARCH works wonders with oil"

WILMOT F. WHEELER JR.
Acco executive v. p.

JAMES B. IGLEHEART
International Steel exec.

JULIUS H. STRASSBURGER
National Steel v. p.

WILLIAM H. PRESTON
Chase Brass exec. v. p.

dolph B. Robert was elected treasurer.

Wilmot F. Wheeler Jr., former vice president, was elected executive vice president, **American Chain & Cable Co. Inc.**, New York.

International Steel Co., Evansville, Ind., elected **James B. Igleheart** executive vice president. He was assistant general manager, Steel Div. **G. Eugene Johnson** was named vice president and secretary-treasurer; **John F. Daly**, vice president and general manager, Metal Products Div.; **Frank J. Bagamery Jr.**, vice president-administration.

G. A. Barris was made general manager, Stainless Processing Div., **Wall Colmonoy Corp.**, Detroit. He was plant manager for the division.

Elmer F. Twyman, a vice president, **Yale & Towne Mfg. Co.**, New York, was elected senior vice president. He directs material handling operations.

Julius H. Strassburger was promoted from director to vice president-research and development of **National Steel Corp.**, Pittsburgh. He is succeeded as director of the department by **Dr. Ivor E. Campbell**, who assumes his duties Feb. 1. He comes from Battelle Memorial Institute.

Frederick J. Greenleaf was appointed purchasing agent, **Bristol Brass Corp.**, Bristol, Conn. **Edward Montella** was named assistant purchasing agent.

Donald R. Hepler was made vice president - manufacturing, **Cooper Alloy Corp.**, Hillside, N. J. He was with ACF Industries Inc. as operations manager.

Gene E. Gann was made director of purchases, **McLouth Steel Corp.**, Detroit. He was vice president of Gaylord Mfg. Co. before joining McLouth in 1954. He has been specializing in procurement of raw materials.

William H. Preston was elected executive vice president, **Chase Brass & Copper Co. Inc.**, Waterbury, Conn., subsidiary of Kennecott Copper Corp. He was with Joy Mfg. Co., where he held executive positions in general manufacturing and sales.

Harry E. Gravlin Jr. joined **Hamilton Standard**, a division of United Aircraft Corp., Windsor Locks, Conn., as production manager, a new post in which he is responsible for factory, purchasing, and production operations. He was manager of manufacturing services, Parts & Equipment Div., Chrysler Corp.

Robert White was made manager of alloy steel sales for **Sheffield Div.**, Houston, Armco Steel Corp.

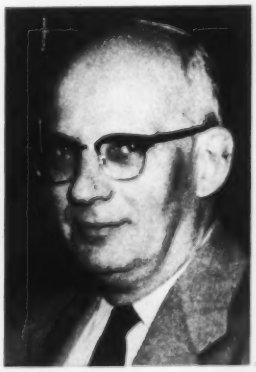
William Eismann Jr. was made manager, national lubrication sales, **E. F. Houghton & Co.**, Philadelphia. He succeeds **C. R. Schmitt**,

(*Please turn to Page* 65)

ELMER F. TWYMAN
Yale & Towne senior v. p.

DONALD R. HEPLER
Cooper Alloy v. p.-mfg.

GENE E. GANN
McLouth Steel purchasing



WILLIAM EISMANN JR.
Houghton management post

"We get ten refrigerator pans a minute...

from one press and with one attendant!" From its motorized coil cradle to its mechanized conveyer, this is a truly automated production unit. Coil stock feeds through the press' seven transfer stations... is easily formed and drawn into deep drawn refrigerator pans. Bliss engineers design and build entire systems like these, including the dies.

Can a transfer feed press work for you? Best way to find out is to ask—ask the people who introduced them in the nineties and have pioneered in their improvement since. Or send for new, case history-packed brochure.

BLISS
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name... it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.

"Not for me, thanks! It doesn't feel solid . . . like BRASS"

The buying public simply was *not buying* a lock made of a lightweight metal. *Reason:* It didn't have the heft of the good solid Brass they were used to. *Result:* The manufacturer came back to Brass. And then his customers came back, too.

Brass has it . . . what the customers want. And Bristol Brass has what the manufacturers want . . . consistent top quality.

The **BRISTOL BRASS**
CORPORATION

Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.

JACK M. CHERNE
Vard engineering dir.

WILLIAM M. McCUE
Steel Improvement mfg. mgr.

R. E. LENHARD
Air Reduction Sales pres.

PAUL E. CATE
Fulton Sylphon eng. post

W. H. WILLIAMS
Eaton purchasing supervisor

B. H. CARMICHAEL
Interlake Iron plant supt.

recently made assistant to the vice president-sales.

Paul E. Cate was made director of industrial and production engineering for **Fulton Sylphon Div.**, Knoxville, Tenn., Robertshaw-Fulton Controls Co.

W. H. Williams, purchasing agent for the Axle Div. of **Eaton Mfg. Co.**, Cleveland, was promoted to the central purchasing staff as supervisor of production parts and mill supply buying. **Richard F. Fitzgerald** was made manager, purchase research and analysis section, central purchasing staff. **William E. Davis,** assistant Axle Div. purchasing agent, was promoted to purchasing agent of the division.

Lt. Gen. C. B. Ferenbaugh, USA, ret., was appointed staff assistant to the president of **United States Chemical Milling Corp.**, Manhattan Beach, Calif.

Richard E. Seifert was named sales planning manager, Semiconductor Div., **Raytheon Mfg. Co.**, Waltham, Mass.

B. H. Carmichael, former assistant general superintendent, Toledo, Ohio, plant, **Interlake Iron Corp.**, was appointed general superintendent. He succeeds **J. Lindsay Johnson,** who was made head of the new Planning and Development Dept. in the company's Cleveland headquarters. **J. B. Kaminski,** former assistant blast furnace superintendent at the Chicago plant, was named blast furnace superintendent in Toledo. **Gaylord Woodward,** former blast furnace supervisor in Toledo, was made assistant blast furnace superintendent in Chicago.

Donald A. Elert was named sales manager, **Milwaukee Valve Co.**, Milwaukee., subsidiary of Controls Co. of America.

Marvel-Schebler Products Div., Decatur, Ill., Borg-Warner Corp., appointed **Gordon Turnbull** vice president and works manager; **Frank Pilling,** vice president-general sales manager and **Thomas P. ValRose** manager of purchasing and planning for control rod mechanisms.

Jack M. Cherne was named director of engineering at **Vard Inc.**, Pasadena, Calif. He was project engineer in charge of helicopter development and flight test at the Aircraft Div., Hughes Aircraft Co.

William M. McCue, former chief metallurgist, **Steel Improvement & Forge Co.**, Cleveland, was advanced to manufacturing manager of the company's E. 64th Street plant. He succeeds **Gustav E. Schrader,** now on special assignment. **Lynn E. Sprague** was made chief metallurgist.

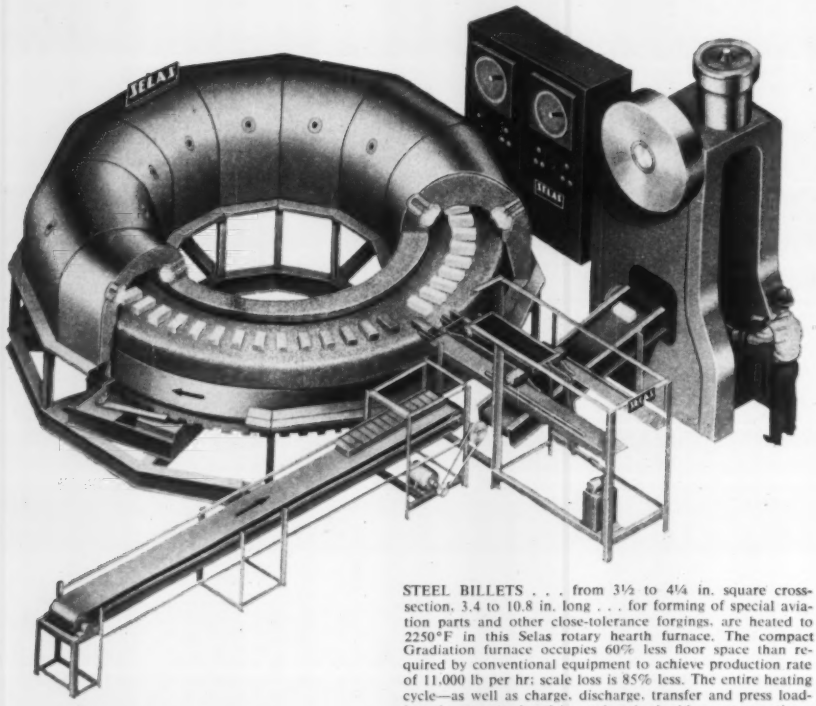
R. E. Lenhard, executive vice president, **Air Reduction Sales Co.**, New York, division of Air Reduction Co. Inc., was appointed president of that division. He succeeds **J. H. Humberstone,** who as vice president (parent firm) will devote full time to corporation affairs.

Robert G. Bryan was named national supervisor of steel industry sales for **Republic Flow Meters Co.**, Chicago, subsidiary of Rockwell Mfg. Co.

Donald L. Price was elected a vice president, **Norton Co.**, Worcester, Mass. He has been sales manager of grinding wheels for the Abrasive Div. since 1955. **Robert Cushman,** manager of marketing services, succeeds Mr. Price. **Harry G. Brustlin,** west coast district manager in Los Angeles, returns to Worcester to succeed Mr. Cushman.

Detroit Stamping Co., Detroit, elected **William H. Roberts** executive vice president. He was vice president-Finished Products Div. **Harry C. Robeson,** stampings sales manager, was elected vice president-sales of all products. **Herbert McMillan** was made sales manager, Stamping Div.; **Charles Hoppe,** sales manager, Finished Products Div.

Jack D. Cavan was made general sales manager, Bolt & Nut Div., **Republic Steel Corp.**, Cleveland. Formerly assistant general sales manager, he succeeds **Harvey Craig,** who was named to the new post of manager of trade relations for the company. **William C. Schnackel,** formerly an assistant sales manager, Bolt & Nut Div., was appointed an assistant sales manager in the Bar Div.



STEEL BILLETS . . . from 3½ to 4¼ in. square cross-section, 3.4 to 10.8 in. long . . . for forming of special aviation parts and other close-tolerance forgings, are heated to 2250°F in this Selas rotary hearth furnace. The compact Gradiation furnace occupies 60% less floor space than required by conventional equipment to achieve production rate of 11,000 lb per hr; scale loss is 85% less. The entire heating cycle—as well as charge, discharge, transfer and press loading—is automated and is synchronized with press operations.

SELAS Gradiation®: Precise Heat Processing for the Steel Industry

Throughout the steel industry — in mills and metalworking plants — Selas Gradiation heat processing is successfully used in many operations. The versatility and adaptability of the Gradiation principle are demonstrated by the diversity of applications shown in the installation photographs on facing page.

Gradiation is a concept and technique of heat processing which coordinates fast, controlled heating with the nature of the workpiece . . . considering its composition, size, shape, heat transfer characteristics and physical properties . . . to develop desired product quality, in minimum time, with maximum efficiency, and with the use of automatic and compact equipment.

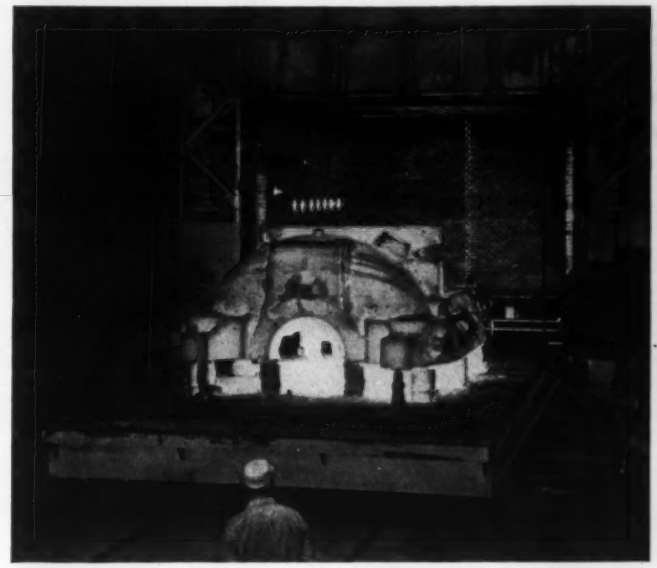
Designed and custom-built to meet your specific heat processing needs . . . for hot working . . . galvanizing . . . tinning . . . heat treating heavy sections and special shapes . . . Gradiation equipment contributes production economy, high production rates, ease of handling.

Selas Engineers will be pleased to discuss your heat processing needs with you and to show you how Gradiation can be adapted to your particular requirements.

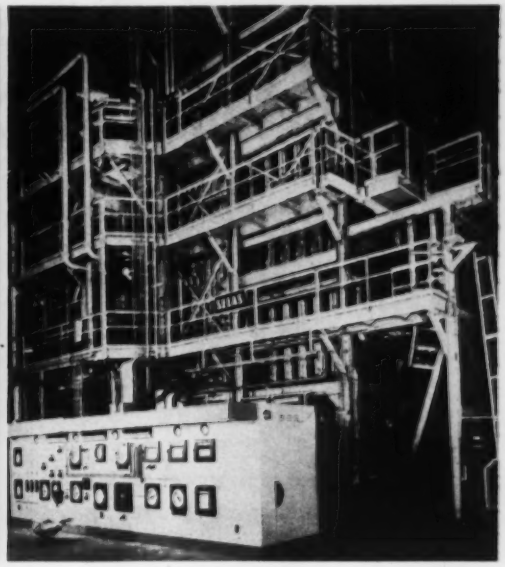
Send for our new 28-page Bulletin No. 21 "Selas Gradiation Heating in the Steel Mill" and article reprint "An Economic Appraisal of Continuous Heat Processing."

SUBSIDIARIES: Selas Constructors, Inc., Houston, Texas; Selas Corporation of America, European Div., S. A., Pregny, Geneva, Switzerland.
INTERNATIONAL REPRESENTATIVES AND LICENSEES: BENELUX, FRANCE—Cie Gle de Construction de Fours, Paris; CAMBODIA, FORMOSA, KOREA, LAOS, VIETNAM—Cosa Export Co., Inc.; AUSTRIA, GERMANY—Indugas, Essen; JAPAN—International Machine Co., Ltd., Tokyo; ITALY—Italiana Gasogeni E. Forni S.r.l., Milano.

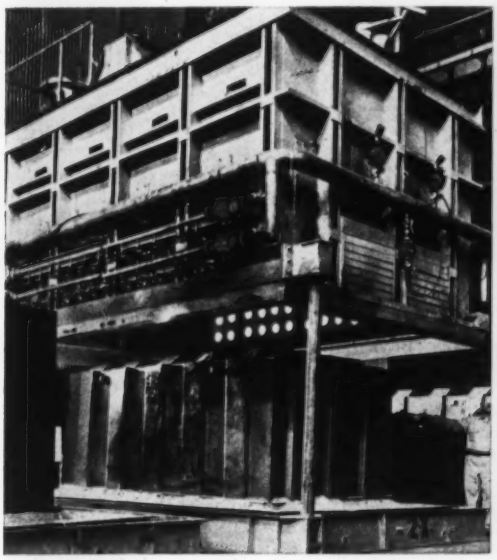
is your reward



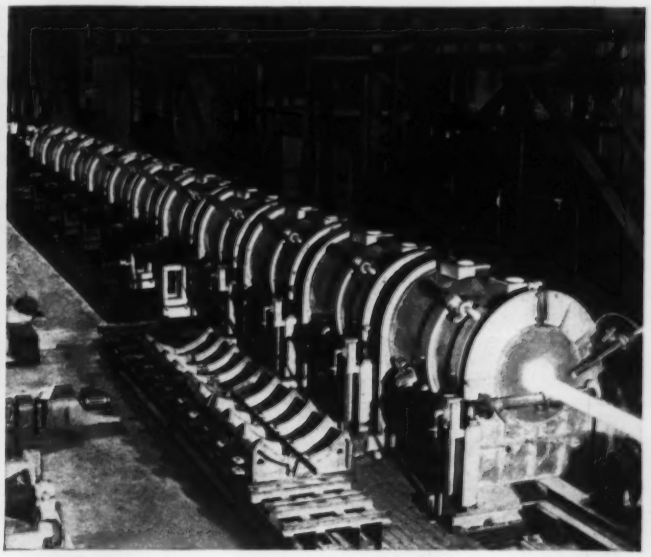
CASTINGS of high alloy steel are hardened and toughened in this Selas Gradiation-fired car-bottom furnace. Picture shows 35-ton turbine shell casting after heating to 1925°F and held at temperature for 10 hr. Turn of a valve converts furnace into lower temperature unit for reheat following air-cooling of casting. Time cycle required for this operation has been reduced 20% through fast heat-up and control possible with Gradiation heating. This type of furnace also is used for heating rolls and die blocks, and is ideally suited for heating sensitive steels as well as such non-ferrous workpieces as molybdenum and tungsten ingots.



STRIP is continuously bright-annealed in this 15 ton/hr. single-pass, direct-fired furnace. Four such compact lines, installed across a standard mill building, provide an eastern steel mill 400,000 tons per year increased capacity. Another installation produces 30 tons/hr; even higher rates can be readily attainable. Designed for fast, uniform heating, Gradiation strip lines are compact, easy to install, simple to operate, economical to maintain. Front panel of control cubicle functionally delineates entire process.



STACKED COILS of steel strip, as well as stacked sheets, weldments, castings and rolls, are batch-annealed in this Gradiation-heated cover furnace. Used as the "shop work-horse," this furnace accepts charges up to 42 tons—of wide diversity in size and shape—with maximum production of one ton per hour and using coke-oven gas as fuel. Duradiant burners fire directly on liner, providing even heat distribution. Burners are set flush in furnace wall to avoid maintenance problems.



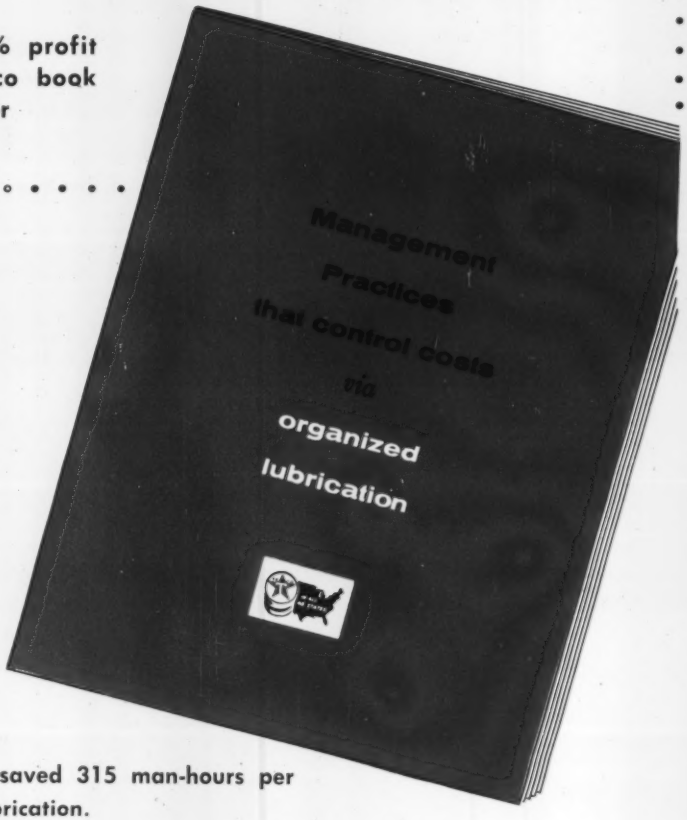
TUBING . . . is normalized and, if required, stretch-reduced in this Selas barrel-furnace line. After forming and welding, the tubing is conveyed through a 48-barrel normalizing line with exit temperature approximately 1650°F. Stretch-mill product proceeds through additional 12 Gradiation furnaces which heat tubing to 1800°-1850°F. Entire process is completely automated.

Gradiation and Duradiant are registered trade names of Selas Corporation of America.

SELAS *Heat and Fluid Processing Engineers*
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA
DEVELOPMENT • DESIGN • CONSTRUCTION

Neglected area of cost-control-opportunity uncovered by NEW BOOK

Guide to potential 4% profit increase makes Texaco book latest business best seller



Why you need it: The Texaco guide uncovers a new area where management can effect real economies in reduced maintenance costs. This is especially important now that decentralization and generally lower profit margins make the profit-and-loss statement the real measure of each plant unit's management efficiency.

What it will tell you: With facts like these, the Texaco guide shows that organized lubrication can raise production, extend parts life, and cut downtime:

★ **A metalworking manufacturer saved 315 man-hours per month through more efficient lubrication.**

★ **A major corporation anticipates substantial maintenance savings through the services of a lubrication engineer.**

★ **A mill has increased bearing life from 16 to 72 shifts by instituting systematic lubrication that insures the right lubricant for each machine.**

How it will help you: Only organized lubrication gives management such an opportunity for savings. For example, a 10% reduction in maintenance costs through better lubrication methods will increase profits up to 4% in the average plant – more than equivalent to a 4% increase in sales. And Texaco's new guide shows how it may be done.

How to get your copy: Simply fill in the coupon, attach it to your letterhead, and mail it to The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THE TEXAS COMPANY
Dept. S-70
135 East 42nd Street
New York 17, N. Y.

TEXACO

Please send me *Management Practices that Control Costs via Organized Lubrication.*

Name_____

Title_____

ELECTROCONTOURING— The aircraft industry's production engineers are experimenting with a new approach to contouring honeycomb cores. They draw the cover skin into a contoured female die—the die is an electrode on an electrical discharge machine. The skin itself is the tool, and during the machining cycle, its contour is reproduced on the core, mating the skin to the core to provide closer fits for bonding and brazing.

BAKELITE BEARINGS— No-lube bearings for miniature instruments or hydroelectric generators can be made of an old standby—Bakelite reinforced with fabric. Russell Mfg. Co., Middletown, Conn. (it makes a wide variety of bearings), claims that auto knuckle joints will take 200,000 miles without breaking down. Bearings have both Teflon plastic and cotton yarns woven into a fabric impregnated with a high strength, heat resistant phenolic. The combination is an improvement of solid Teflon types.

BRAIN-BUILDERS UP SIGHTS—Magnetic tapes or films kept extremely cold (minus 450° F) may revolutionize computers, experts believe. A recent Philadelphia meeting brought out the fact that the technique will hasten the advent of a computer with practically instant, random recall, just as our brain remembers. Such a device could also store vastly larger amounts of data. One unit might even serve an entire city.

EXTRUDING DUCTILE IRON—Watertown Arsenal, Cambridge, Mass., extrudes structural sections from hot castings. It says heat-treated sections show good strength and ductility, and make satisfactory parts for assembly.

SIDELIGHTS ON NUCLEAR METALS— Testing nuclear rocket engines brings up some uncommon problems for metallurgists. Even some distance from the reactor, carbon and stainless steels pick up an induced radiation. Aluminum does not. (Even soil near the engine can be troublesome.) Apparently, hydrogen is used with such engines, and heat transfer to a flame deflector is said to be three times as great as that experienced with ordinary rockets. (Flame temperatures of regular rockets run at 5000 to 6000° F.)

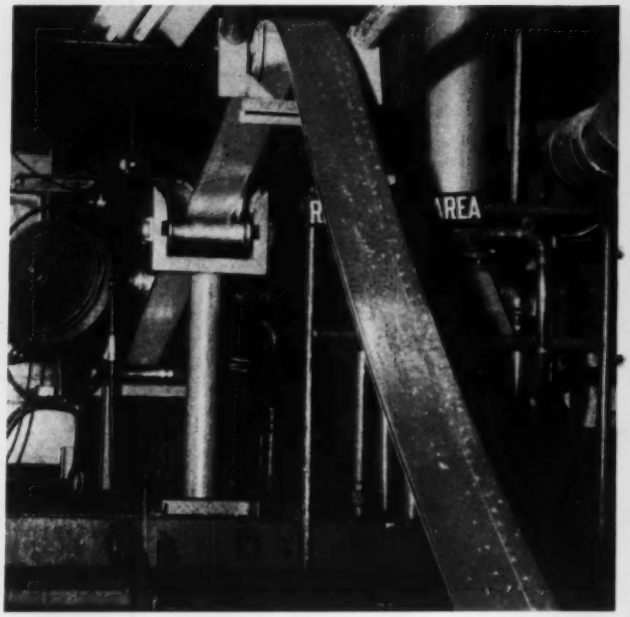
SOVIET KNOWHOW— Here's another example of technology behind the Iron Curtain: Huge storage tanks (like those for oil) are welded from flat sheets on the ground, rolled up like a window shade and transported to the erection site. The base is unrolled, then the wall section is upended and unrolled around the base and joined to the bottom by arcwelders.

IDENTIFICATION— A new paint makes it possible for you to letter and number steel parts permanently. It is brushed or sprayed on bare metal. No matter how many times you paint over it, the formula instantly penetrates the coating, revealing the original lettering, says the maker, Phillips Products Inc., Cleveland.

ARMY SAVES WITH GUN DRILLS— As much as 50 per cent of the drilling time on high alloy steel is being saved through the use of carbide-tipped gun drills. The Army reports it's making holes in one pass with less than 0.002 in. per foot runout, a diameter within 0.0005 in. of the prescribed dimension, and a surface finish smoother than 16 microinches.

PREDICTS UNDERWATER TANKERS— All-welded underwater cargo vessels which weigh 100,000 tons and travel 65 mph were predicted by David Brown, president, Bureau of Ships, at a meeting of the American Welding Society in New York.

Operator drops a 50 lb aluminum pig into a 450-kw electric induction furnace where it's melted at about 1300° F. The furnace has melting and holding compartments



The ½ in. thick, continuously cast strip emerges from the Coors-developed casting wheel. It then rides over two idler rolls and goes directly to the rolling line

Continuous Casting, Impact Extrusion Spark Revolution in Aluminum Partmaking

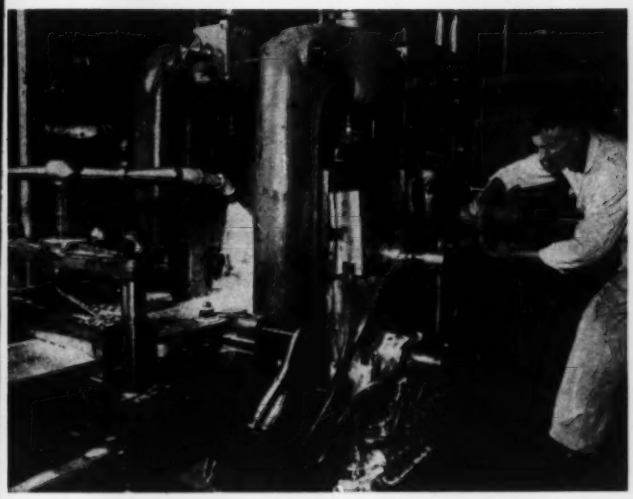
This two-in-one production line is processing aluminum pig into cans. Key to the process is a casting wheel that delivers ½ in. thick strip to the rolling mill

IMPACT extrusion of aluminum parts has turned another technological corner with the advent of a new line at Adolph Coors Co., Golden, Colo.

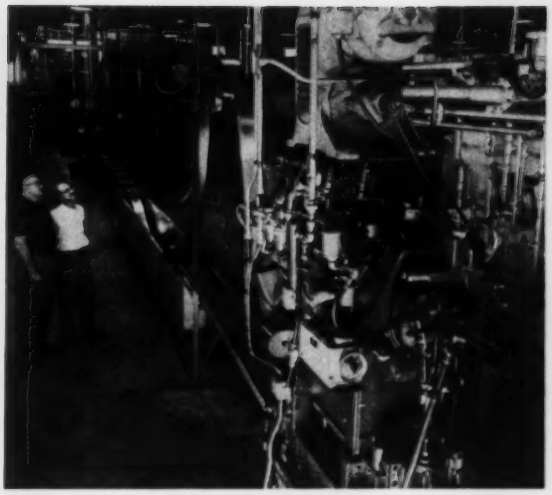
The line, to be announced this week, makes 7-ounce aluminum beer cans. The techniques have potential for many manufacturers of other aluminum parts.

Coors engineers wrestled with these two basic problems in getting their line into economical production: First, how do you get extrusion slugs at a cost low enough to permit the over-all can to be competitive with conventional tin plate types? Second, how do you set up an automated canmaking line that will produce the volume needed, will be reliable, and economical to run?

• **Answers**—The canmaking process that solved the problems is made up of two production lines in one. The first converts aluminum pigs into extrusion slugs; the second transforms the slugs into cans, ready for filling.



The cast strip is first reduced in a hot mill. Here it is shown being cooled and sent into the cold rolling mill where it is rolled to final thickness—about ⅛ in.



Here, near the end of the continuous line, cast and rolled aluminum strip rises into a loop, then goes into the blanking press. Output: About 3000 lb of slugs an hour

Slugs rise on a belt conveyor into the annealing furnace where they are heated for about 1½ hours. Their emergence from annealing (shown here) marks the end of the continuous line

Jack Porterfield (left), chief engineer on the aluminum can project, and William K. Coors, president, Adolph Coors Co., hold one of the 50 lb aluminum pigs the company is converting into beer cans on the new production lines

Making Slugs

Coors buys aluminum in 50 lb pigs from primary aluminum suppliers. The 2S alloy is more than 99.5 per cent pure. The first step is to melt the pigs in a 450 kw electric induction furnace—it has two compartments, one for melting, the other for holding.

Furnace capacity is 2000 lb an hour, but by preheating the pigs, Coors is getting 3000 lb an hour out of it.

• **Key to Continuous Casting**—The molten metal is poured from the furnace onto a "casting wheel." Its complex design is the secret to the company's ability to cast thin, relatively wide strip continuously.

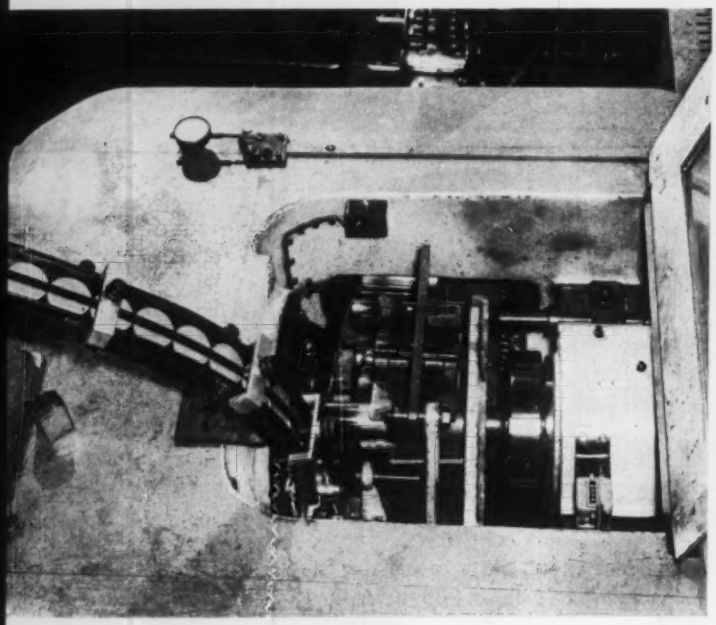
The wheel will cast strip ½ in. thick, 4 to 8 in. wide. It can also be set up to cast strip up to 1 in. thick, with corresponding increases in widths.

The strip is now coming from the wheel at the rate of 10 to 15 linear feet a minute. Jack Porterfield, chief project engineer, tells STEEL that speeds to 45 linear feet a minute are possible with the proper furnace capacity. That would amount to as much as 6000 lb of cast metal an hour.

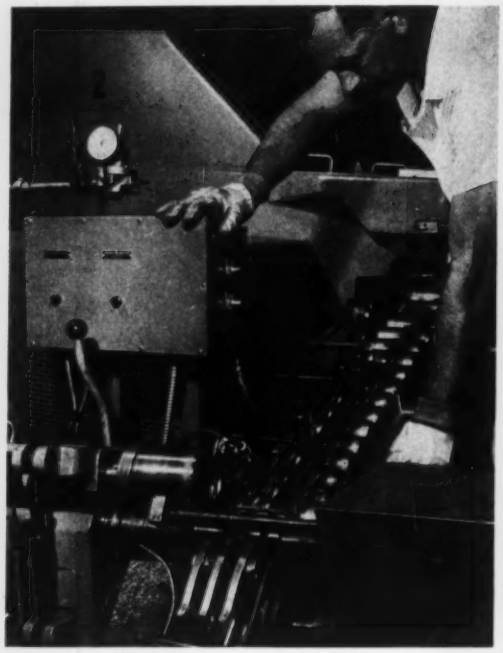
• **Along the Line**—From the casting wheel, the thin strip rides over idler rolls and goes directly into the rolling mill. Passing through the hot and cold stands, the strip is reduced to a thickness of ⅛ in.

From rolling, the unbroken strip

IMPACT EXTRUSION



Annealed slugs ride the chute at left into a 400 ton Herlan impact extrusion press, where they are converted into cans at the rate of 3600 an hour. This is one of two such presses used to feed the can line



Emerging from the extrusion press, the cans are trimmed to length and flanged. Next, they are degreased and etched, providing a surface ready for decorating

feeds automatically to the blanking press that stamps out as many as 3000 lb of slugs an hour—roughly the equivalent of 66,000 cans. Blanking scrap is returned to the melting furnace, eliminating waste.

Blanked slugs drop from the press onto a conveyor that takes them into the annealing furnace for the 1½ hour cycle that delivers them with just the right softness for extruding.

The only time this sequence is broken is when the line is changed to turn out stock for the lids. Strip coming from the rolling mills is fed into 600 lb coils instead of going into the blanking press. Lid stock is rerolled on another mill. It emerges 0.015 to 0.020 in. thick.

The finished and annealed slugs are ready for conversion into cans.

Making Cans

Each of two German-built presses, used to feed the can line, extrudes 3600 flat-bottomed seamless cans an hour. Feed to the presses and ejection from them are automatic. Both presses were reworked by Coors engineers to adapt them to the line production.

Following extrusion, the cans are trimmed to length and are flanged. Next, they go into a special degreasing and etch bath that prepares the surface for four-color decorating.

• **Five-in-One**—Cans ride a chain conveyor to a four-color cylindrical offset lithography press where buff, gold, red, and black decoration is applied. The press originally printed one can with each revolution of the drum; Coors engineers modified it to print four cans per turn. It also applies an overcoat of finishing varnish.

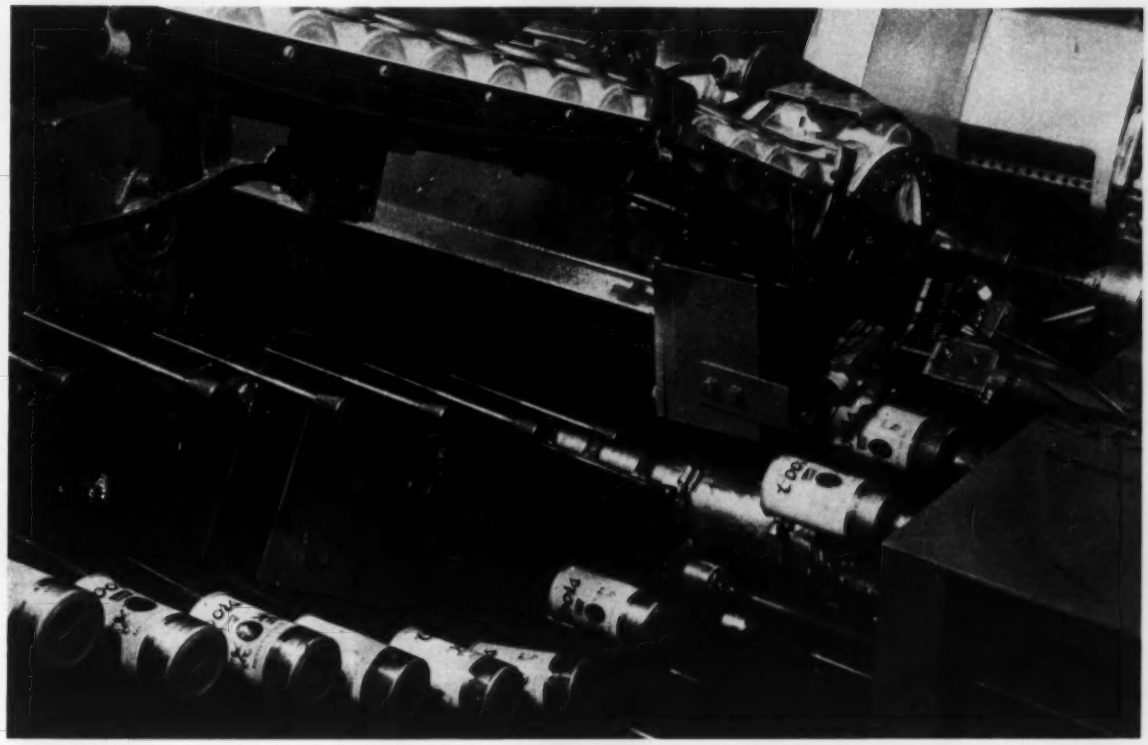
The exterior varnish is thoroughly dried as the cans zig-zag through a 20-ft baking oven. As they emerge, interiors of the cans are sprayed with a protective vinyl coating. There is no need to spin the can or reciprocate the nozzle (developed by Coors) to get an even coat.

As a final step, the cans go through an oven that bakes the internal vinyl coat into a hard protective finish.

• **The Beginning**—In 1954, Coors and Beatrice Foods Co., Chicago, decided to go together on a project that would make possible the economical production of aluminum beer cans. Beatrice faced a problem in its brewing operation in Honolulu, Hawaii, where conventional beer cans were not available to the brewery. Joining forces, the companies created Aluminum International Inc., with Coors as the research and development arm of the project. Coors built a special plant in Golden and began to design and develop machinery to put the program into effect.

One problem, the high cost of aluminum slugs suitable for the extrusion process, led Coors into the field of slugmaking and eventually to continuously cast thin strip.

• **Plans**—Coors spokesmen feel that the aluminum can, in its present state of development, can be reasonably competitive with tin plate only if the food or beverage processor is willing to make his own cans. William K. Coors, president, told STEEL his company is ready to of-

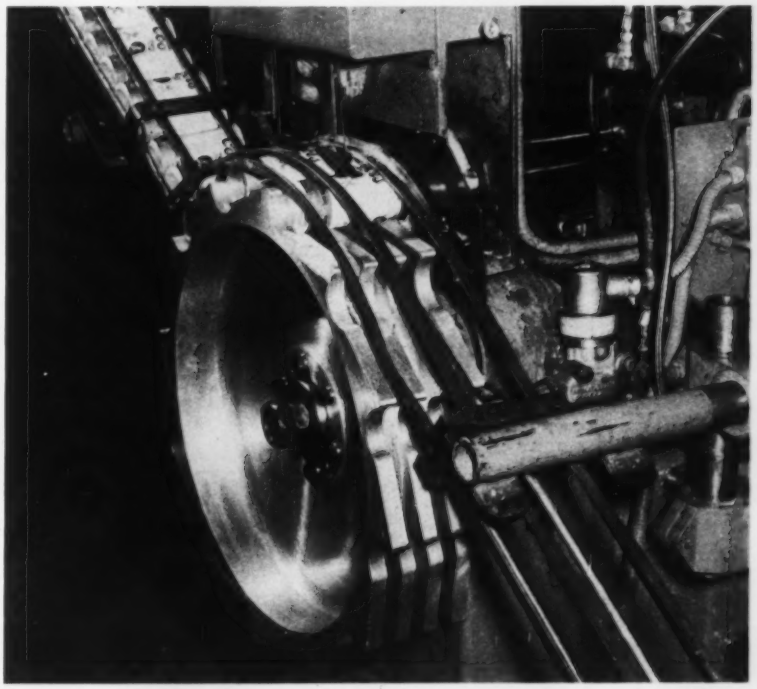


In this four-color cylindrical offset lithography press, 6000 to 7000 cans an hour are decorated with buff, gold, red, and black. An overcoat of finishing varnish is added

fer the extrusion and canmaking knowhow to industry. Negotiations with several prospective can users are underway.

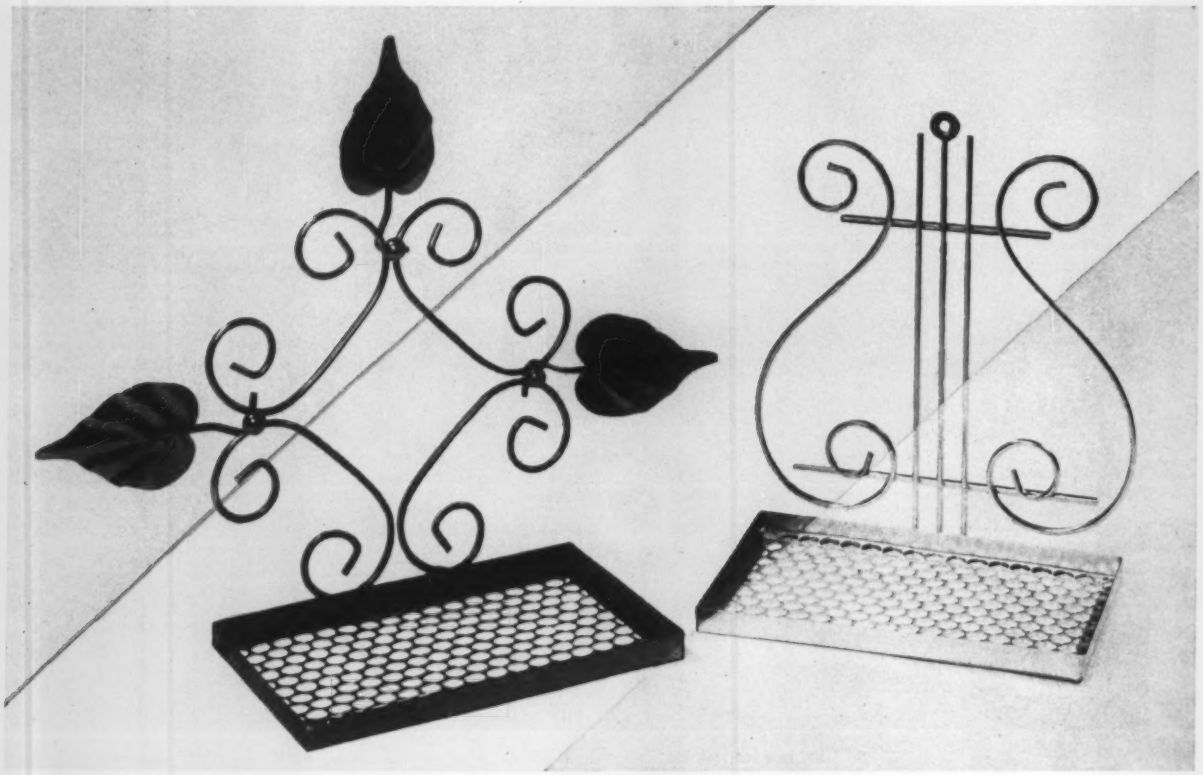
Since the Coors slug producing line will turn out more blanks than the company needs to convert to cans, Mr. Coors says aluminum impact extrusion slugs are already being shipped to established industrial users and can companies.

Evaluating their new can, Coors officials see these advantages: It is about 60 per cent lighter than conventional cans of the same size, and is equally as strong; there is virtually no waste from either the blanking press or the can trimming and flanging machine, since all scrap can be returned to the furnace; the cans have a reclaim value. Coors plans to offer to buy back used cans at 1 cent each. This will provide a source for some of the metal, at the same time reducing the highway and park litter problem.



After the external decoration is baked, the cans come to this station where a Coors-developed nozzle sprays an internal vinyl coating. The coating is applied without rotating the can or reciprocating the nozzle. Final step in the canmaking line is oven drying of the vinyl

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



Inexpensive Chromates Give Zinc Surfaces Color Appeal

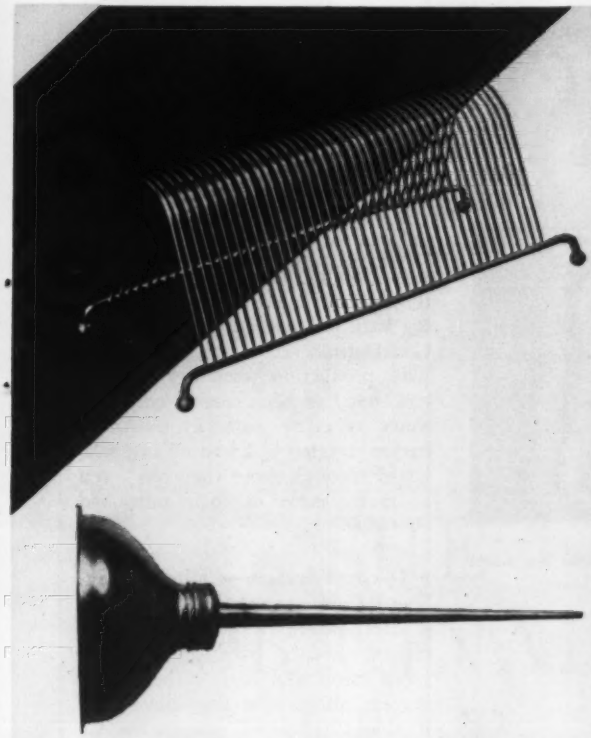
Zinc and zinc-plated steel take on a corrosion resistant coating which can be colored evenly. Partmakers can add eye appeal for 1/50 of a cent a square foot

PEOPLE who use zinc or zinc-plated materials now can take advantage of an inexpensive, high quality method of adding color to their products.

The method: Zinc chromate conversion coatings. Twenty-four hues are available. One supplier, Chemical Corp., Springfield, Mass., calls its product Luster-on.

A company that makes wire products says the coatings cost less than 1/50 of a cent per square foot.

Here's what Alfred Mastrianni of Job Plating Co., Plainville, Conn., has to say about them: "Many of our customers are in wire goods, selling to gift shops and novelty trades. Color is high fashion this year. The clear chromate finishes rival nickel and chrome which cost much more to produce. The addition of a wide range of uniform colors through dyeing has stimulated the use of zinc and chromate tremendously. By using matched materials and the right process, we simulate brass, copper, and silver. The pastels, deep color blues, and brilliant greens greatly boost sales. Dyed finishes don't chip or peel, a



How Chromate Coatings Form

Chromating solution is made from a powder (about 1 ounce per gallon) in a 1 per cent (by volume) solution of nitric acid. The acid dissolves some of the zinc when parts are immersed. As the acid is consumed, the combining power of chromium in the solution changes and precipitates chromium hydroxide. A film builds up until the face next to the zinc becomes nonacid. That stops the reaction. The resulting gel-like film is allowed to harden. It is in itself quite corrosion resistant, but it is also a premium base for paint.

Applications

Eyeglass screws, refrigerator shelves, bird cages, flower and umbrella stands, roller skates, drapery hooks, and small builders' hardware.

plus factor in counter selling."

• **Function Explained** — Such coatings imitate anodized aluminum but cost considerably less. Zinc chromate chemicals react with the zinc to form a gel-like film which hardens and protects metal from corrosion. Dyeing takes place while the film is still soft.

Clear film can be formed on highly polished zinc surfaces. The result is much like a chrome or nickel plated surface. Engineers at Chemical Corp. recommend a lacquer coating for maximum abrasion resistance. It's especially useful for wire products which get a lot of counter handling in dime stores.

Dyeing does not alter salt spray resistance. A good coating will stand up for 18 to 24 hours in a regular spray test.

Fading depends on the hue you choose. Pastels are exceptionally light fast, but the deeper tones don't hold up quite as well. Luster-on colors will take a 300 hour exposure in a fadeometer. (Deep hues last around 30 to 40 hours.)

• **Method Is Important**—In chemical conversion coatings, you get exactly what you pay for, warns B. H. Gardner, Chemical Corp.'s executive vice president. The dyeing process is an excellent quality control test. Poor, uneven coatings will show up as spotty coloring.

Good technique is not hard to come by. Eliminate absolutely all carryover—any trapped alkali carried over from a plating operation is murder to phosphate coatings (the exhibit above explains some of the chemistry). Several of the dyes are good chemical indicators—alkaline or acid solutions change the color of the dye.

Chemical Corp. believes its formula licks the problem of uneven coatings. It recommends this production sequence: 1. Zinc plate. 2. Rinse. 3. Chromate dip. 4. Rinse. 5. Dye (for clearwork, you dip the parts in a bleach). 6. Cold water rinse. 7. Warm water rinse (120° F). 8. Dry the parts.

• **Other Applications** — Mahoning Valley Steel Co., Niles, Ohio (a subsidiary of General Electric), dips zinc coated electrical conduit in clear chromate. The result is an iridescent finish which some marketing people call Rainbow pipe.

A number of people who find brass plating troublesome have turned to chromate coatings. One maker of trunk hardware used a 10 minute brass plating that was lacquered to prevent corrosion. Chromate solved the problem and improved appearance.

An automaker gets more eye appeal under the hood by treating zinc diecastings (carburetors, fuel pumps). RCA colors the legs of one of its TV models that way.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Stylus, wrapped in cotton and dipped in electrolyte, is brushed over the parts where they're to be joined. Tin deposit permits soldering without fluxes

Plating Aids Soldering

This newly developed process leaves a finely controlled, sharply defined deposit; no bulky tanks or large amounts of electrolyte are required

HERE'S a plating technique that will help you solder delicate parts without using corrosive fluxes.

The process was developed by Dalic Metachemical Ltd., Toronto, Ont. It's used for tinning sections of aneroid barometer elements before they're soldered together.

The plate is easy to apply: With one rectifier lead clamped to the workpiece, wrap the graphite anode in cotton, saturate with electrolyte, and brush it over the area to be plated. It leaves a sharply defined deposit.

• **New Method Saves Time**—Formerly, the oxide film on heat treated diaphragms was ground or lapped off, then the edges were tinned for soldering. Now, the surfaces to be joined are deoxidized electrolytically, rinsed, and plated immediately with a flash of tin or tin-lead alloy.

Hand cleaning and possible damage are eliminated. Selective plating techniques and solutions can be used on diaphragms made of silver, beryllium copper, stainless steel, aluminum, and many other alloys.

• **Shouldn't Age**—Parts should be soldered soon after they're plated. Aging of the tinned surface will prevent effective soldering. If parts must be stored for some time before soldering, they should be flash coated with gold, which won't oxidize.

• **Eliminates Hand Soldering** — A second method eliminates both the flux and the manual soldering operation. A thin plate is deposited on each contact edge, and diaphragms are placed in a controlled atmosphere oven at 500° F for 5 minutes. A strong, leakproof diffusion seal is produced.

• **Versatile Process**—With a quick change of anode and solution, the equipment can be adapted for many plating applications. There's no need for large tanks or large amounts of expensive electrolyte.

Surface Hardening Increases Tool Life

In production tests, treated tools showed gains of 200 to 1000 per cent over untreated

PREMATURE failures of high speed steel cutting tools can be avoided through the use of a surface hardening bath developed by A. F. Holden Co., Detroit.

In production tests, keyway cutters that had been treated cut three times as many parts as untreated cutters; treated 1/4-26 two-fluted taps lasted through more than ten times as many parts as their untreated equivalents.

• **Hardens Surface**—Called the Hy-Speed Case process, the bath gives greater wear resistance and increases surface hardness to high speed steels and high carbon, high chrome alloys after they have been hardened, tempered, and ground.

Time in the bath is determined by the size, shape, and application of the tool. It can vary from 5 to 90 minutes.

• **Must Clean Tools**—For maximum results, Holden engineers recommend that the bath be aged for 12 to 14 hours before it is put in operation. Tools must be thoroughly cleaned of oil, dirt, and other contaminants.

Operating range of the bath is from 950 to 1150° F. Temperature must not exceed that of the original tempering of the tool material. After treatment, tools are allowed to cool in air. They are then washed and dipped in oil to prevent rust. The bath compound is soluble and washes away readily in hot water.

• **User Benefits** — The Hy-Speed Case process will offer the most benefit to users of automatic equipment where a dulled cutting edge or premature tool failure can shut down an entire line.

The process offers these specific benefits: 1. Increased surface hardness. 2. Better wear resistance. 3. Keener cutting tool edges. 4. Reduced tool setting and grinding time. 5. Increased production. 6. Toughening of soft skin, if any, due to faulty hardening.

US PowerGrip T

THE ORIGINAL BELT WITH TEETH

The U.S. PowerGrip "Timing"® Belt is one belt that delivers POSITIVE drive, non-slip performance all the time. During the eight years since it was patented by "U.S." this "Timing" belt with teeth has been popularly referred to as the "T" belt.

So indispensable has this "Timing" belt become that thousands of plants, girding for power and automation, are using the T belt. It not only gives non-slip performance, it will never stretch and will outlast all others. Besides, it requires no lubrication, no maintenance. And since this belt requires virtually no initial tension at installation, think of how this prolongs bearing life.

Your U. S. Power Transmission Distributor carries a full line of stock sizes, has the experience and engineering know-how to help you convert quickly and easily.

• • •

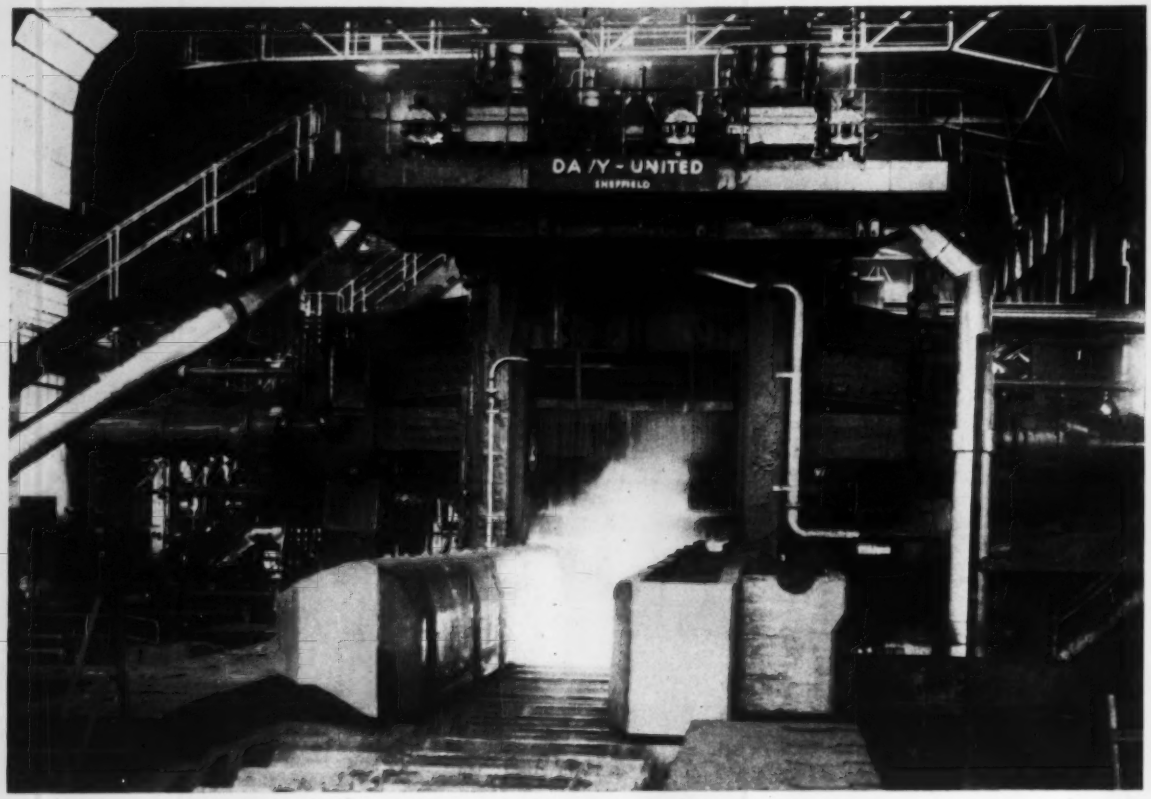
When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.



New universal slabbing mill in operation 12½ days after start of changeover

Welsh Mill Rebuilt In Less than Fortnight

Ingot production had to be increased, so a bigger slab mill was needed; cost of a long shutdown was prohibitive; the changeover had to be made rapidly

HERE'S how you can replace heavy equipment (or an entire mill) with a minimum of downtime: Plan the changeover down to the last detail, then see that all personnel are briefed thoroughly in advance and as the work progresses.

Steel Co. of Wales Ltd., worked 1000 men in three shifts to dismantle a slabbing mill and install a new one at the Abbey Works, Margam, Wales. The job took only 12½ days.

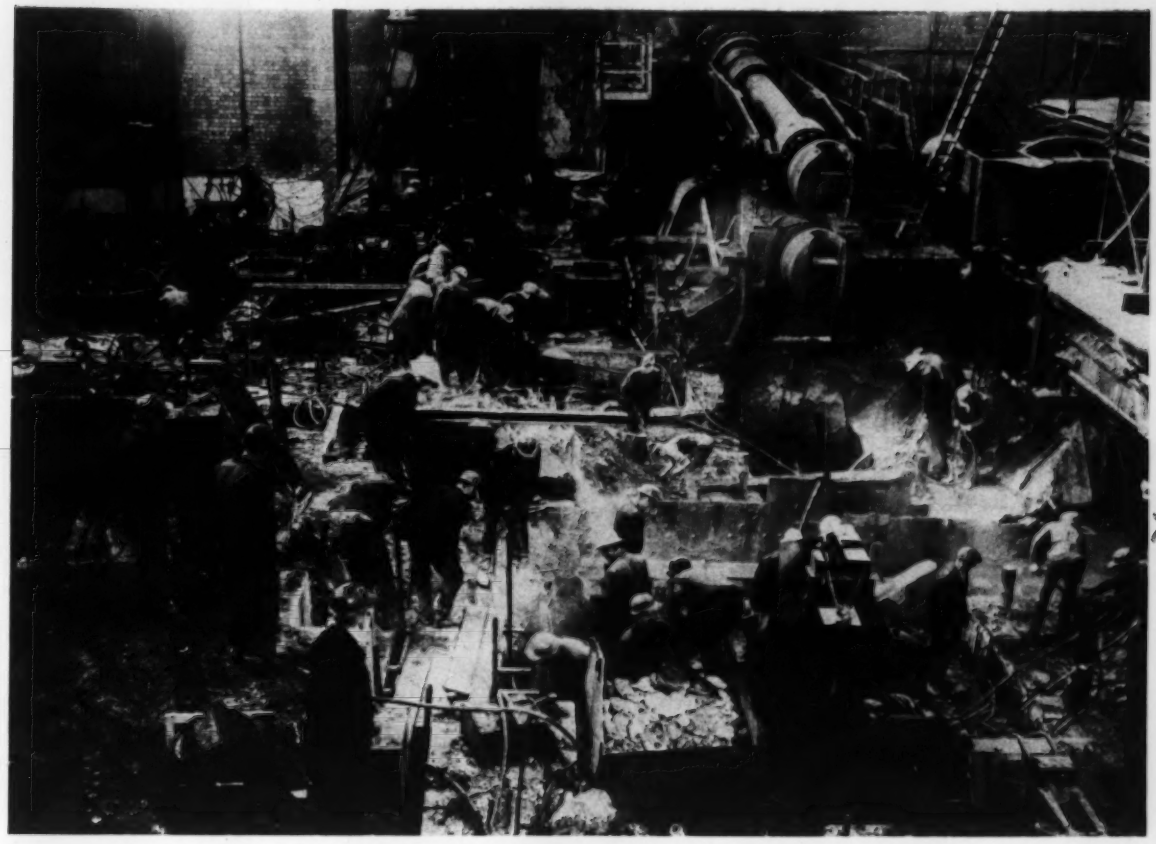
On completion of a $140 million expansion program next year, ingot production at the works will be increased to 67,000 net tons a week, vs. 54,000 tons now. The new, $4.2 million, universal mill was built by Messrs. Davy & United Engineering Co. Ltd., Sheffield, England. It will handle the increased production and produce slabs of better quality.

• **Planning Covers Three Years—** Since all ingots produced at the works pass through one slabbing mill, interference with production was inevitable.

Only 14 days were allowed for the changeover to keep downtime to a minimum.

The replacement was finished on schedule only because of careful planning over a period of three years—all preliminary operations and the changeover itself were worked out in detail.

Exact scale models of both the old and new mills were dismantled and erected, time and again, to



Old rolling mill has been removed; foundations are being modified to receive much heavier mill. Elapsed time: Less than two days

show each man assigned to the job what he was required to do.

Briefing conferences were held regularly for 12 months before and as often as possible during the changeover. Wall charts were used to show hour by hour progress and models were altered from time to time once work was underway.

A careful study was made of the lifting gear and the number of crane lifts that could be made in the 14 days allowed.

• **Special Design Required**—Headroom was inadequate for a conventional universal mill, a type popular in the U. S. Engineers of Steel Co. of Wales worked with Davy & United engineering personnel to design a mill that would meet all requirements. It has vertical rolls that are driven through a new type gearbox (mounted above the mill) and 10 ft vertical spindles.

The mill was assembled in Sheffield before it was delivered. All required adjustments were made; parts were made ready for immediate installation and use when they arrived at the Abbey Works. Davy & United personnel helped on the installation.

• **Mill Building Modified**—A block of concrete, 5 ft thick and covering 220 sq ft, had to be removed from the old foundations to accommodate the 159-ton sole plate of the vertical edger mill. After the new level of concrete was exposed, it was dressed smooth where 18 in. square packing plates were to rest. When the sole plate was bolted in place, a check showed it was level within 0.006 in.

Most of the electrical work, including installation of a 4000 hp, direct current motor to drive the vertical rolls, was completed before the changeover was started.

Equipment was handled in the largest possible subassemblies to save time. The old mill, weighing 1540 tons, was removed in two days.

The new, 2660-ton mill included some items weighing as much as 140 tons. None weighed less than 500 lb; the heaviest were the screwdown assembly (90 tons) and the mill housings (140 tons each).

• **Strip Rolling Continues**—While the slabbing mill was being rebuilt, the hot strip mill, using operating stocks and 65,000 tons of slabs purchased in advance from other steelmakers, continued operation.

Because it was not advisable to increase ingot stock while slab production was halted, iron and steel output of the works was reduced. Some furnaces were shut down in the melting shops. Lighter pig iron demand permitted blast furnaces to be shut down (one or two at a time) for repairs.

ROCKFORD MACHINE TOOL CO. 2500 KISHWAUKEE STREET ROCKFORD, ILLINOIS

SPEED and VERSATILITY

of

Rockford Hy-Draulic Shaper-Planers

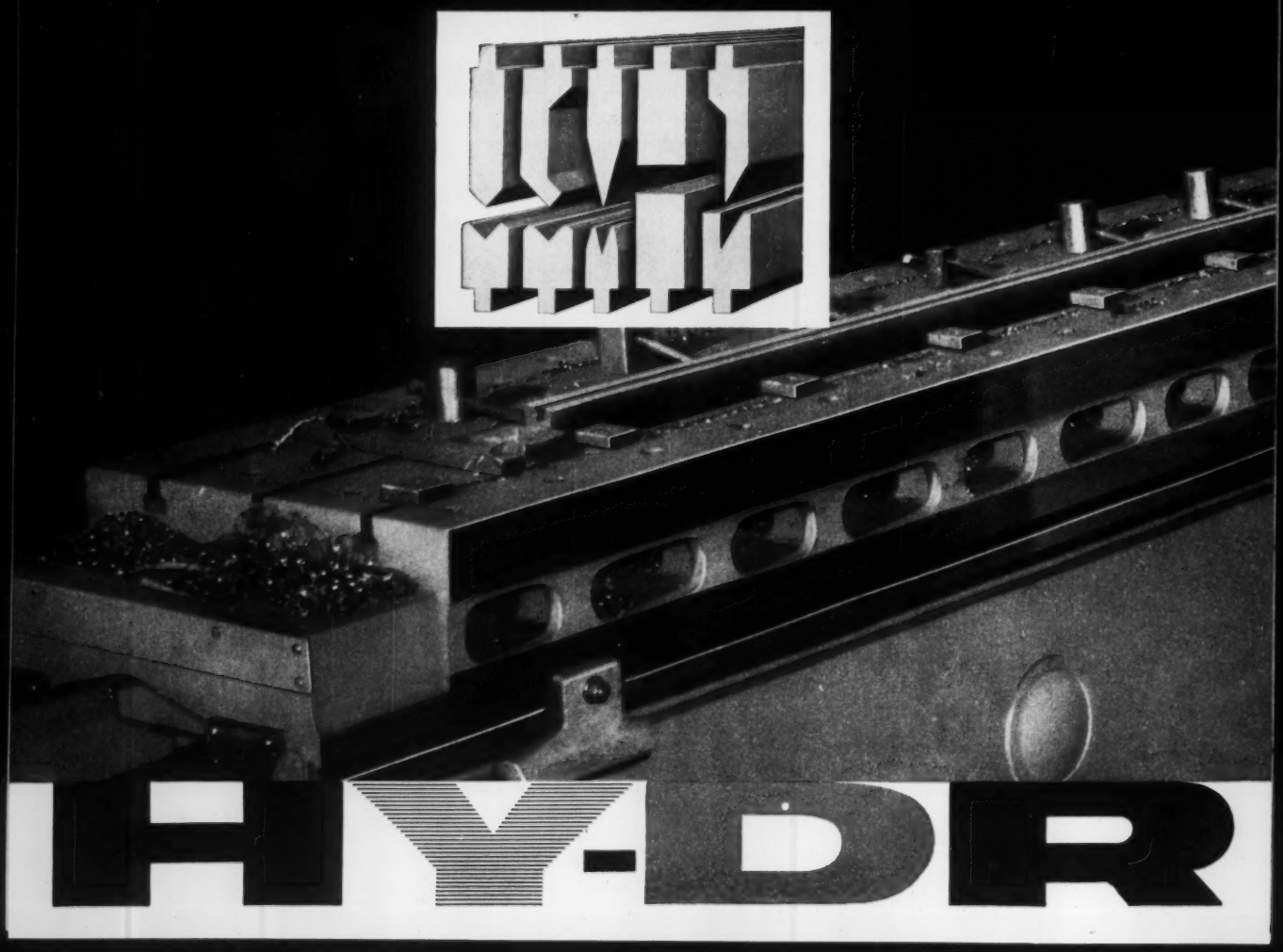
provide

"Off-The-Shelf Delivery"

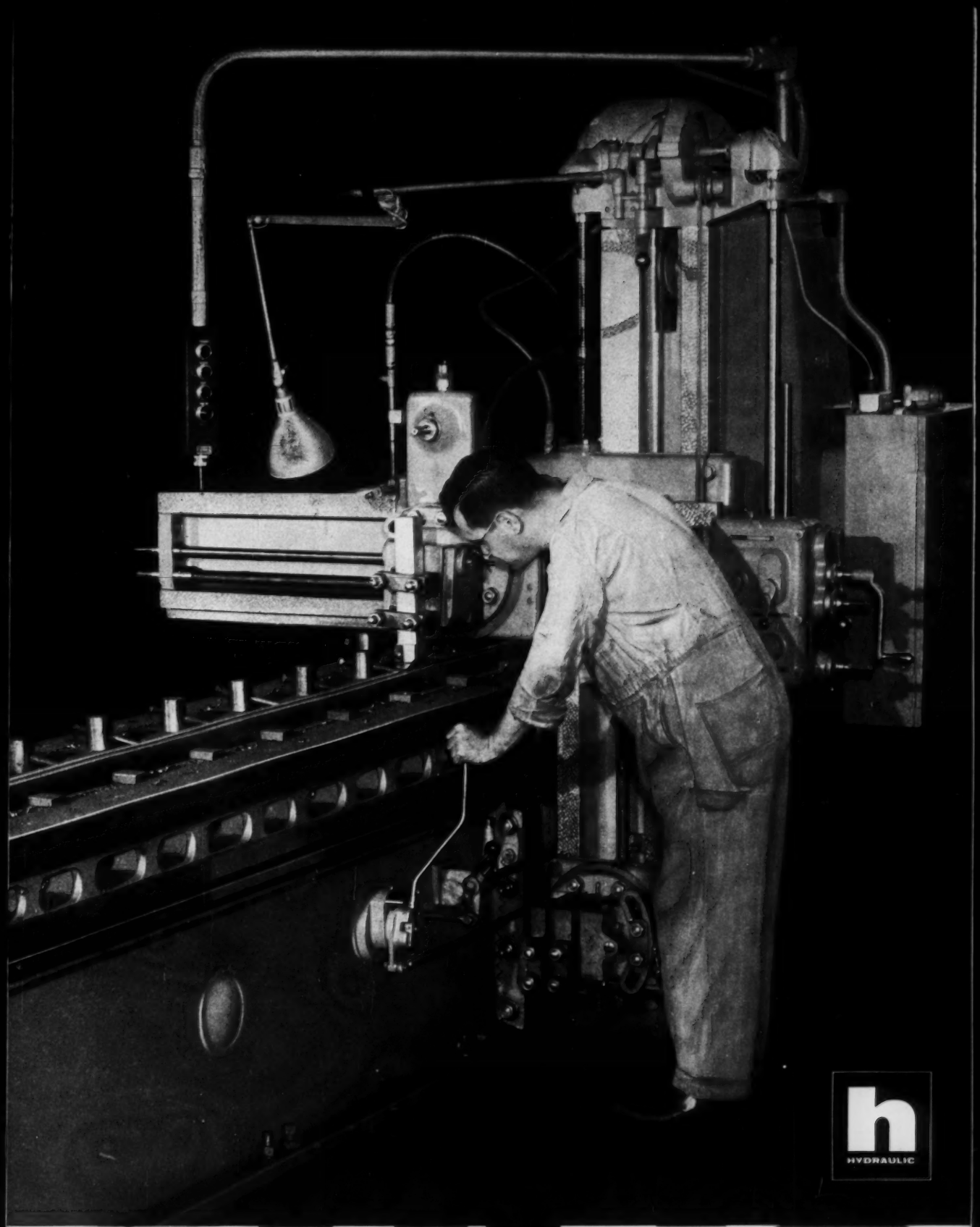
for

DREIS & KRUMP

CHICAGO PRESS BRAKE DIES



HY-DR



AULIC

Assemblies, immersed in cleaning solution, are lowered into ultrasonic bath. On removal, they're inspected with microscope. Inset: Bellows before (left) and after cleaning

Cleaning Delicate Parts? Ultrasonics May Be Answer

One company is using method to remove brazing flux from small bellows. Job that once took 15 minutes is now done in seconds. Longer service life is assured

THE BEST way to do a job is often the fastest. That's why one company turned to ultrasonics for removal of foreign material from delicate metal parts without damaging them.

In making pressure-sensing devices for aircraft, Westport Development & Mfg. Co. Inc., Milford, Conn., found ultrasonic cleaning ideal for removing brazing flux from small bellows. Equipment was obtained from Narda Ultrasonics Corp., Westbury, N. Y.

• **Thorough Cleaning a Must**—The tiny assemblies, made of beryllium copper, Inconel X, or stainless steel 0.002 in. thick, are silver brazed. All flux must be removed from the assemblies after brazing to assure reliable service.

The cleaning method previously used—boiling and hand brushing—took as much as 15 minutes per unit. The Narda Son-Blaster does a better job in a few seconds.

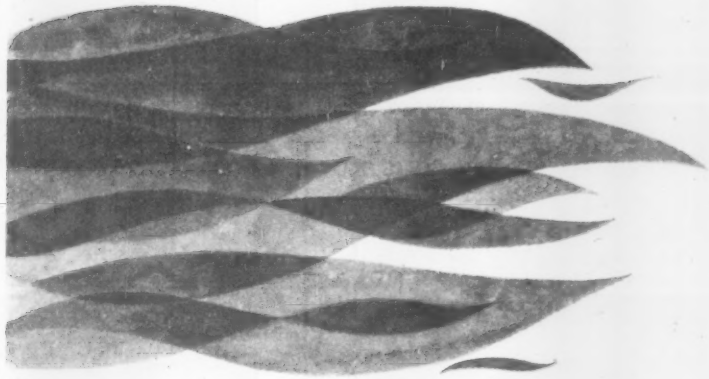
Inspection time is also reduced because ultrasonic cleaning takes soil from all parts of the immersed assembly simultaneously.

• **Uses Ordinary Detergent**—Warm water, with ordinary detergent as a wetting agent, is used as a cleaning solution. Assemblies are cleaned one at a time by dipping, or in batches in a beaker. (Ultrasonic vibrations pass through the beaker without loss of energy.) When the beaker is used, less cleaning solution is required for each batch.

• **How It Cleans**—Ultrasonic vibrations cause alternate compression and decompression of the cleaning bath; surges of small bubbles are created and collapsed.

Foreign matter is literally blasted from the surface of the immersed part, even from blind holes, contours, threads, or other hidden areas; a thorough cleaning job on small parts or complete assemblies is assured.

KAISER CHEMICALS



Average of 470 heats with endwalls of Kaiser Periclase Chrome brick!

450 Heats: "In #4 Furnace, endwalls of Kaiser Periclase Chrome Brick lasted 450 heats—longer than any competitive brick used."

403 Heats: "Kaiser Periclase Chrome Brick tested in endwalls of furnace averaged 403 heats (while competitive endwalls in same furnace campaigns averaged 265 heats)."

557 Heats: "Earlier this month this furnace finished its third campaign for a total of 557 heats with endwall of Kaiser Periclase Chrome Brick. (Competitive brick last only 180-200 heats in other furnaces in shop.)"

3 | 1410 (Total)

470 AVERAGE

Operators testing Kaiser brick against competitive brands consistently come up with reports like these—proof of the money-saving performance advantages you gain with Kaiser Periclase Chrome Brick. Here are the properties that make possible such performance:

1. Low Chromite Content. Chromite content is the minimum amount necessary to provide thermal shock resistance (only 9.1% Cr_2O_3). Lowering of chromite also reduces swelling in presence of iron oxide, thus minimizes buckling and peeling.

2. Uniform High Strength because the ceramic bond is formed BEFORE the chemical bond burns out.

3. Outstanding Resistance to Distortion, Shrinkage — no liquid phase in the conversion from chemical to ceramic bond.

4. Excellent Resistance to Chemical Attack by furnace fumes, iron oxides and slags is assured by high magnesium oxide content, maximum brick density (low porosity), and chemically stable composition.

Make a comparison test and see how much more life you get with Kaiser Periclase Chrome Brick. Your Kaiser Chemicals Sales Engineer will be glad to help.

Call or write Kaiser Chemicals Division, Dept. S9212, Kaiser Aluminum & Chemical Sales, Inc., at any of the Regional Offices listed below:

PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . 1924 Broadway

Refractory Brick & Ramming Materials • Castables & Mortars • Magnesite Periclase • Deadburned Dolomite • Aluminas • Magnesias

Properties of Armco 22-4-9 Bar Stock

(Heat treated at 2150° F for 1 hour and water quenched, then aged at 1400° F for 14 hours and air cooled)

	Room Temperature	900° F	1100° F	1200° F	1400° F	1600° F
Tensile strength	162,000	114,000	100,000	86,000	62,000	38,000
0.2% yield strength	102,000	58,000	53,000	48,000	37,000	25,000
Elongation, % in 2 in.	9.0	20.0	18.0	16.0	18.0	27.0
Reduction in area, %	9.0	21.0	24.0	23.0	25.0	39.0
Brinell hardness	344	236	218	205	194	177

Alloy Stands Up to Heat

Armco's new chromium-manganese-nickel steel retains much of its room temperature strength at elevated temperatures. It is fully austenitic and nonmagnetic

FABRICATORS of equipment that must operate under corrosive conditions at 900 to 1600° F have a new construction material to work with.

Armco Steel Corp., Middletown, Ohio, has developed a stainless steel (it's called Armco 22-4-9) that should find use in power equipment, chemical process reactors, and similar applications. Two examples: High temperature steam valves and gas turbine parts.

The alloy is high in chromium (20 to 23 per cent), manganese (7 to 10 per cent), and nickel (3 to 5 per cent). It has a carbon level of 0.45 to 0.60 with a maximum silicon content of 1 per cent and 0.30 to 0.50 nitrogen.

• **Properties**—The stainless is completely austenitic in all conditions. At room temperature, it exhibits a hardness of Brinell 300 to 550, depending on the method of processing.

At elevated temperatures, the material retains a high degree of its room temperature strength. It shows a distinct advantage over martensitic and ferritic alloys that suffer a severe decline in mechanical properties over 1000° F. In one test, Brinell 344 material had a hot hardness of Brinell 250 at 1100° F after 1000 hours at that temperature.

The alloy is nonmagnetic. That property makes it of interest for such applications as nonmagnetic ball and roller bearings. Its high room and elevated temperature hardness makes it resistant to wear, erosion, galling, and seizing.

• **Heat Treatment**—Standard procedure for heat treating involves a solution and aging treatment (2150° F for 1 hour and water quench, plus 1400° F for 14 hours and air cool). In that condition, the microstructure shows a finely dispersed carbide precipitate within an austenitic matrix.

Added room temperature hardness can be obtained by hot working the material. Example: By finishing at 1600° F, hardness values of Rockwell C50 to 55 have been developed. The alloy remained austenitic and nonmagnetic.

Cold working of the alloy in the solution treated condition will achieve hardnesses of Rockwell C40 to 45. Minimum hardness (annealed condition) at which the material can

be supplied is Rockwell C30 to 35.

• **Machining**—Armco recommends that its new alloy be machined in the hot-rolled condition, or after the solution and aging treatments. When the material is machined after solution treating, it is "gummy." Also, the work hardening rate under the tool is much greater. To facilitate machining, the alloy is made with 0.12 per cent sulfur.

Cutting is done best with lubricated abrasive discs or by hot shearing.

• **Forging**—The material is readily hot forged or upset. Initial forging temperature may range from 2000 to 2400° F. The smaller the cross section of the billet or bar, the higher the temperature that may be used without damage from overheating.

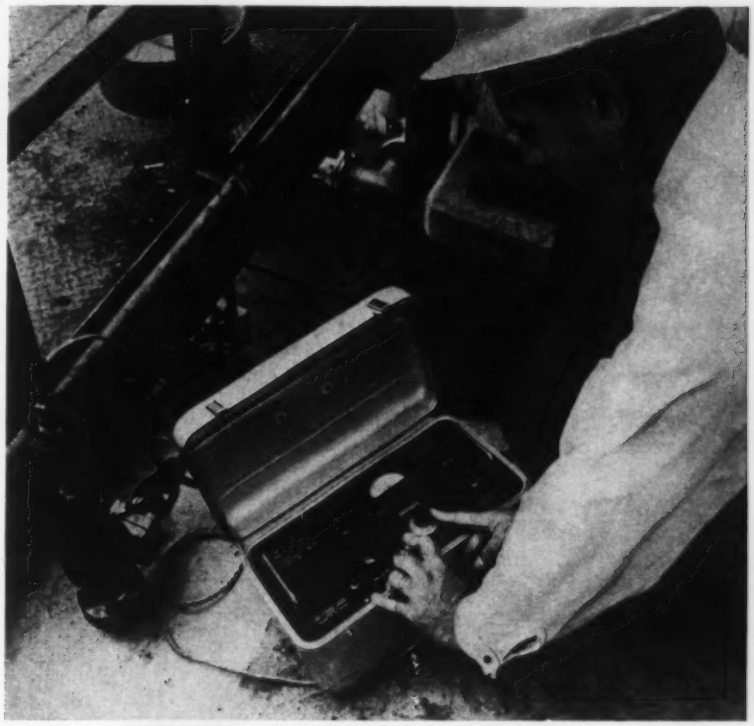
Example: A series of severe upsetting operations using 0.500 in. diameter material may be done from an initial temperature of 2400° F, but a 3 in. square billet with only moderate work should be forged at 2150° F.

Because of its relatively high carbon content, care must be taken to avoid decarburization. Long times at soaking temperatures should be avoided. Induction heating is a good method. Electric muffle furnaces with air atmospheres are more desirable than oil or gas-fired furnaces, says Armco. Inert gas or dry hydrogen atmospheres are suitable.

• **Welding**—The alloy is weldable and can be joined by any of the methods used for stainless steel. Because it is austenitic, it can be welded without preheating or postheating and is not susceptible to cracking.

Examples: Electrical flash butt-welding of valve stems; cladding of valve faces with hard surfacing alloys by oxyacetylene and inert gas, shielded arc processes; arcwelding of pipe valve components. Covered arcwelding electrodes of 22-4-9 composition have been used in welding experiments to deposit metal for surfacing applications.

• **Availability**—Armco will supply the material in forging billets and rounds ⅜ to 3 in.



Engineer makes a spotcheck to determine the extent of corrosive attack

Device Tells on Corrosion

This measuring instrument sharply reduces the cost of controlling internal corrosion in pipe lines and process equipment. It provides an hourly or daily record of attack

THE EFFECTIVENESS of corrosion inhibitors can be checked quickly by process engineers with an electronic instrument that detects as little as a millionth of an inch of attack.

Developed by Crest Instrument Co., a division of Magna Products Co., Santa Fe Springs, Calif., the device provides hourly or daily records of corrosion in pipe lines and process equipment.

• **Applications**—It has been used by plant engineers to run rapid comparison tests on inhibitors.

In another instance, it helped engineers find a faulty pump in the inhibitor supply system. When the inhibiting compound was introduced into the system, the instrument revealed a 75 per cent decrease in corrosion within 36 hours.

When the corrosion rate leveled out, engineers suspected that the specified dosage was not entering the system. An inspection revealed the faulty pump. When the trouble was corrected, the corrosion rate resumed its decline, stopping at 5 per cent of the initial rate.

• **How Device Works**—The electronic instrument uses two probes which are made of the same material as the equipment being checked. One is exposed to the corrosive, the other is protected by plastic or ceramic material.

As the exposed probe corrodes, its resistance increases. By measuring the resistance ratio of the exposed probe to the protected one, a direct indication of corrosion is obtained.

CAM-ALLOY STEEL
HIGH TEST STEEL
WROUGHT IRON

Come To CAMPBELL For *The Complete Line* of SLING CHAINS

**every type — every size
every grade — every attachment**

Whatever *your* particular application, Campbell will deliver exactly the right assembly! All Campbell Sling Chains are available in 3 grades—Cam-Alloy Steel, High Test Steel and Wrought Iron.

GUARANTEED FOR A FULL YEAR!

Send *today* for your *free* copy of Campbell's new Sling Chain Handbook

It contains complete details on all Campbell Sling Chain equipment—together with lots of valuable information on care and use. And you'll find step-by-step instructions for ordering each type of sling chain and attachment—illustrations—specifications and working load limits for all grades.

CAMPBELL CHAIN *Company*

CAMPBELL CHAIN

York, Pa. • West Burlington, Iowa

***Warehouses:* E. Cambridge, Mass. • Seattle, Wash. • Portland, Ore. • San Francisco, Los Angeles, Calif.**

Coating Promotes Savings

A new phenolic-vinyl coating for metals can be applied without sandblasting the surface. The metal needs only wire brushing before primer and top coat are put on.

Union Carbide Plastics Co., division of Union Carbide Corp., New York, claims the savings possible with the new system are considerable. It says the sandblasting is as costly as all other steps combined.

The coating system calls for the use of a phenolic resin-based primer with a vinyl top coat. It has been tested on exposure panels and Florida and Pittsburgh industrial areas, plus two years in use.

The excellent gloss retention and durability of the vinyl top coat augments the high corrosion resistance and adhesion of the phenolic primer, explains Union Carbide.

Expander Moves to Job

A mobile unit which can be moved from one line to another as it's needed may be what you're looking for.

It's an expander that's designed to form and size electric motor shells. Mounting the machine on wheels so it can be rolled to the area where it's needed gives the user the advantage of several machines at the cost of one.

The expander is self-contained, requiring only a connection to an electric power source to operate. The unit was built by Grotnes Machine Works, Chicago.

TV Licks Noise Problem

Television systems have built a reputation for doing a job under conditions that are intolerable for humans—atomic radiation, heat, cold, hazards of accidental explosion.

Now, here's another: Noisy environments from levels that are merely uncomfortable to those that could shatter the hearing.

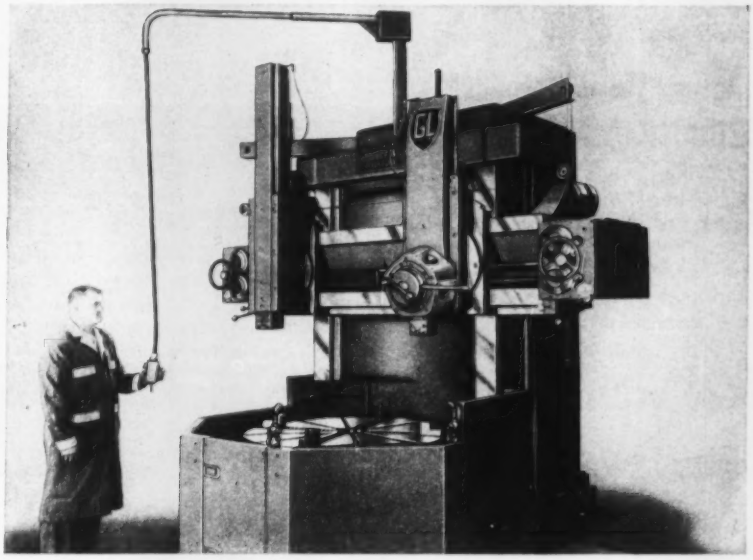
A camera built by the Kin Tel Div. of Cohu Electronics, San Diego, Calif., is being used on rocket and jet engine test stands. It has withstood sound levels above 190 decibels.

All-Electric Vertical Lathe Needs Less Space

AN ELECTRIC power transmission control in this 52-in. vertical turret lathe offers some important user benefits: 1. Ability to change speeds while the table is in motion and the tool is in the cut. 2. Wide range of speeds from a compact drive. 3. Simplified control with pushbutton or tape system.

The manufacturer says the lathe requires one-third less floor space than conventional machines of the same rated capacity. The design permits rigid close-coupled tooling needed for high-speed machining with carbides and ceramics.

Key to the compactness of the machine is a coaxial, planetary transmission which fits into a small space in the housing. It contains four planetary gear sets. By energizing different series of electric clutches, gear combinations can be obtained which give 32 speeds to two ranges. Separate shafts and sliding gears are eliminated.



A discrete positioning, tape-control system is optional. The system permits making tool wear compensating adjustments through the control console without altering the master tape. For more information, *write* Kaukauna Div., Giddings & Lewis Machine Tool Co., Kaukauna, Wis.

Transistorized Gages Handle Wide Range of Jobs

FOR those gaging jobs that require a wide measurement range, Pratt & Whitney has introduced a new line of instruments that features completely transistorized circuits and four separate magnifications.

Compact, light, and readily portable, the Trans-O-Limit Gages can be used in the shop and on the production line. Accuracy of readings is not affected by normal voltage and frequency fluctuations.

The gaging circuit operates at 5000 cps which permits minaturization of several important components. As a result, gaging pressure is less than 1 ounce and will not distort small and delicate workpieces or mar highly finished surfaces.

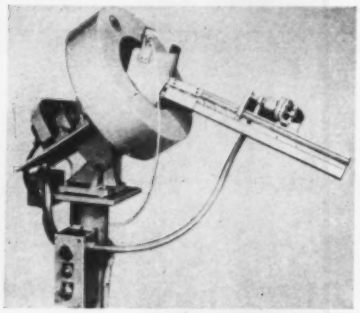
The Trans-O-Limit line consists

of a cabinet containing a power unit and indicating meter which can be used with a height gage, external comparators, snap gages, or cartridge units. For more information, *write* Pratt & Whitney Co. Inc., West Hartford 1, Conn.

Rotary Hopper Feeds 2000 Parts an Hour

CONTINUOUS orientation and controlled flow of 2000 parts an hour are possible with this rotary hopper. Since parts are oriented on the feed track, jamming and resultant part damage are virtually impossible.

Parts are lifted from the bottom



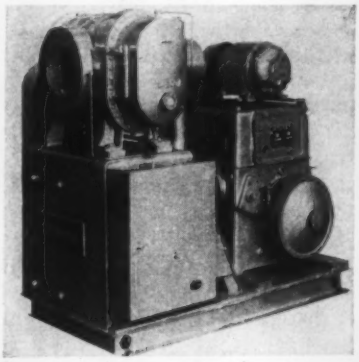
of the bowl by hardened cleats on the selector ring and deposited on an inclined discharge track as the hopper rotates.

Standard tracks (they can be adjusted or changed in less than 1 minute) are available for cylindrical, rectangular, headed, or disc type parts. The tracks can be set to feed one machine or several.

For more information, *write* Industrial Automation Equipment, Radio Corp. of America, 13541 Auburn Ave., Detroit 23, Mich.

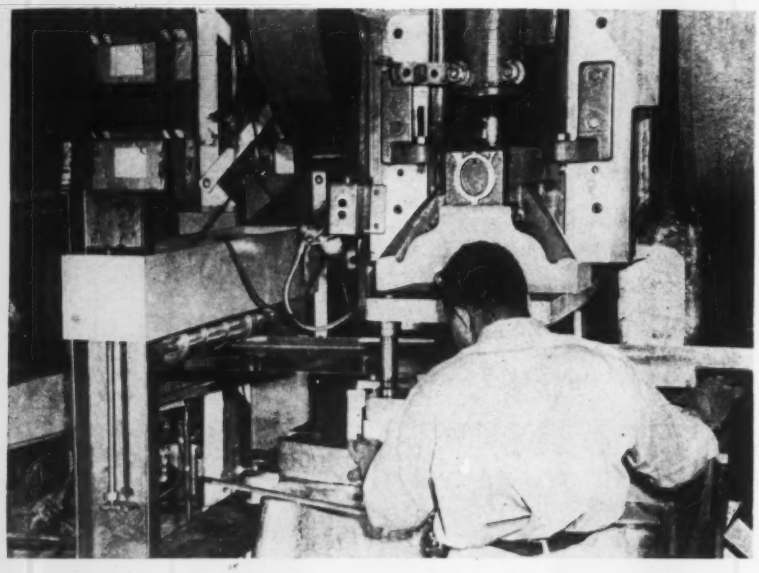
Vacuum Pumps Handle Large Volume Loads

A SERIES of four mechanical booster vacuum pumps has been developed to economically handle large volume loads in the 10 micron to 1 millimeter range.



The units are integrated two-stage pumping systems, built on a common base plate. The first stage is a Roots-type dry blower that acts as a supercharger for the second stage, a standard Stokes gas-ballasted Microvac rotary pump of the appropriate size.

Model 1710 has a maximum pumping speed of 1050 cfm; Model 1711, 1250 cfm; Model 1712, 2900 cfm; and Model 1713, 5100 cfm. For more information, *write* Vacuum Equipment Div., F. J. Stokes Corp., 5500 Tabor Rd., Philadelphia 20, Pa.



Magnetic Transfer Boosts Output

YOU CAN automate the transfer and removal of many parts you have been handling manually by adding a magnetic system called the AAC Automatic Hand.

Intended primarily for use in handling large parts and those which cannot be handled mechanically without damage, it can be applied to presses, roll forming machines, press brakes, shears, welding equipment, and similar machines.

It is versatile. You can automate an entire line or such simple operations as removing blanks from a press and stacking them.

The system uses electromagnets and electromagnetic rollers which can be free-standing, mounted on the machine, or in various kinds of frames.

For more information, *write* American Actuator Corp., Box 384, Stamford, Conn.

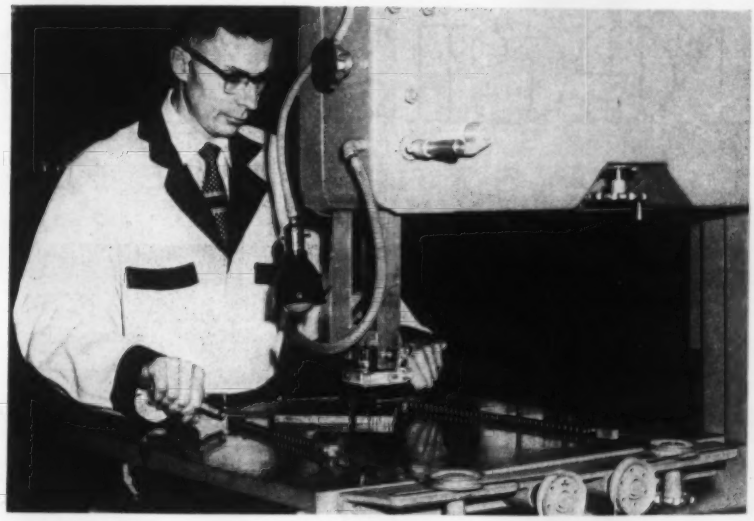
Tester Mounts on Wall

WANT to conserve valuable bench space? This new tensile testing machine mounts on the wall.

Tests can be made on flat or round specimens with sufficient accuracy for laboratory use. Operation is simple enough for production use.

The stationary jaw holder can be adjusted for specimens 5 to 13 in. long. Breaking or yield point is indicated by a maximum-pointer hand that is carried along by the pressure hand on the gage.

Models are available with capacities up to 40,000 lb. For more information, *write* Steel City Testing Machines Inc., 8817 Lyndon Ave., Detroit 38, Mich.



Band Machine Has Tool Selector

THE Enterprise bandsawing, filing, and polishing machine has a tool selector for 57 different materials and a built-in bandwelder.

Its variable speed drive provides 35 to 6500 fpm blade speeds; the machine may be built to provide speeds up to 15,000 fpm. The four-speed gearbox is operated from a single control.

A quick tension release mechanism automatically adjusts blade tension. A built-in air blower keeps the work surface clear of chips. Other features: Conveniently mounted front controls and foot-controlled automatic feed.

The machine is priced at $4595. For more information, *write* Enterprise Co., Columbiana, Ohio.

Press Controls Provide Antirepeat Protection

A NEW system of press control permits you to increase press operator safety and protect machines, dies, and fixtures.

Called the Andrus-Cool Press Control System, it is applicable to new equipment or modernization of all single-stroke cycling machinery.

Two separate control circuits are included in the system. Each monitors the other for failures. If a failure occurs in one system, the other takes control and stops the machine at the end of the stroke. Further operation is prevented until the trouble is repaired.

The manufacturer says the control system can be applied to presses, shears, conveyors, and material handling devices in automatic lines. For more information, *write* Fawick Airflex Div., Fawick Corp., 9919 Clinton Rd., Cleveland 11, Ohio.

Variable Speed Drives Handle Small Loads

YOU CAN put the advantages of variable-speed drives to work on those smaller jobs that require $\frac{1}{8}$ through $\frac{3}{4}$ hp.

This line of Reliance V-S drives is designed for small conveyors, grinders, welding positioners, packaging machines, agitators, and similar equipment.

The drives use a single half-wave thyratron electronic tube as the main rectifier and operate on 50 or 60 cycle, 220 volt, ac power. Transformers adapt the units to other voltages.

The control unit weighs only 30 lb and can be mounted on the driven machine or remotely. The drive motors are available in enclosures to meet all industrial requirements. For more information, *write* Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

NEW literature

Write directly to the company for a copy

Tips on Sawing

Bulletin 578, a 31-page saw blade handbook and catalog, offers hints for better cutting and longer blade life. It describes common cutting problems and tells how to solve them. Ladish Co., Cudahy, Wis.

Chains and Attachments

A complete line of roller chains, sprockets, and conveyor chain attachments is described in a new 98-page catalog. The booklet also gives engineering formulas and installation data. Acme Chain Corp., 821 Main St., Holyoke, Mass.

Listing of Ferroalloys

"Vancoram Products" gives the compositions and applications of ferroalloys for additions of chromium, silicon, manganese, vanadium, columbium, boron, and titanium. Other products include special foundry alloys such as vanadium metal, silicon metal, and aluminum alloys. Vanadium Corp. of America, 420 Lexington Ave., New York 17, N. Y.

Enclosed Industrial Switches

The 20-page catalog 83c gives complete details of nine housing groups of metal-enclosed switches. Explosion-proof, maintained-contact, prewired, hand-operated, and sealed switches are a few of the 99 listings. Micro Switch, a division of Minneapolis-Honeywell Regulator Co., Freeport, Ill.

Resistance Welding Practices

Bulletin PP-54 describes all phases of resistance welding and gives information on the basic principles of the method. The 28-page booklet provides data on how to calculate welding pressures, current, tip diameters, and other information for users of the equipment. Federal Machine & Welder Co., Warren, Ohio.

Guide to Silicone Products

The 1959 Reference Guide to Dow Corning silicone products describes what silicones can best meet the needs of problems ranging from adhesives to release agents, resins to rubbers, and dielectrics to water repellents. The 16-page booklet also shows where the products are being used. Dow Corning Corp., Midland, Mich.

Properties of Ductile Irons

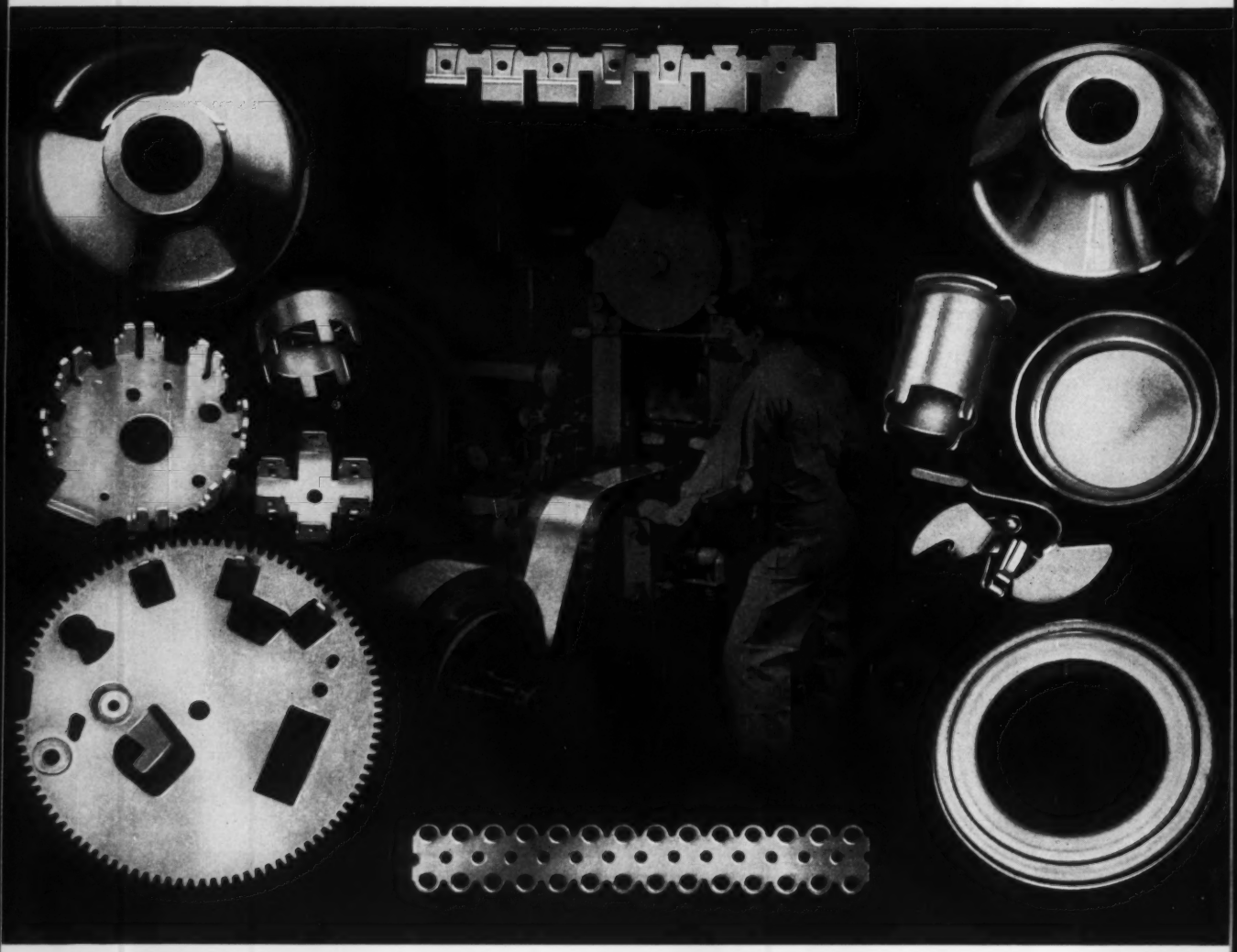
A 28-page booklet tells the story of Ni-Resist ductile irons that combine strength and toughness with resistance to heat, wear, and corrosion. Tables and graphs explain mechanical and physical properties. Reader Service Dept., International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

Power Lubrication Systems

A 32-page catalog describes a line of lubrication equipment that includes automatic centralized systems, semiautomatic, and manual methods of lubricating machines. Lincoln Engineering Co., 5702-33 Natural Bridge Ave., St. Louis 20, Mo.

J&L Precision

COLD-ROLLED STRIP STEEL



For Precision Products Of Strip Steel Use Engineered Quality

Jones and Laughlin Precision Cold-Rolled Strip Steel is produced to *your* specifications . . . designed to meet *your* particular fabricating requirements. The first cost is not always the most important . . . the end-product cost is the important consideration. By using J&L Precision Cold-Rolled Strip Steel, you may find, as others have, that your labor and machine costs can be reduced.

J&L Strip Steel is more than just another cold rolled strip steel. It is a specialty product produced by a specialty operation accustomed to working with unusual specifications. A precision product is usually needed to produce an unusual or special end-product.

J&L Stainless and Strip Division produces a full line of restricted and standard specification strip steel in these grades and types: Low Carbon • High Carbon Tempered Spring Steel • Electrolytic Zinc • Alloy • Stainless

J&L STEEL PRECISION COLD-ROLLED STRIP STEEL

Let us engineer quality into your product.

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Youngstown 1, Ohio

Output Climbs to 15-Month Peak

January 12, 1959

STEELMAKING continued its steady recovery last week as mills turned out their biggest tonnage since October, 1957. Production was about 2,109,000 net tons of steel for ingots and castings.

Comparison of last week's ingot rate (74.5 per cent of capacity) with the previous week's 76 per cent is misleading, since we've switched to a bigger measuring stick: Annual capacity of 147.6 million ingot tons as of Jan. 1, 1959, vs. 140.7 million in 1958. By the 1958 standard, last week's rate was 78 per cent.

LIGHT STEELS LEAD— Sheets are continuing to pace the market as automakers, appliance manufacturers, and other consumers step up their consumption or replenish their stocks. January shipments will be as good as December's or slightly better. Delivery promises on cold-rolled products are nearing an average of eight weeks. Hot-rolled sheets are still available on short notice, with leadtime pegged at three to four weeks.

GALVANIZERS BULLISH— With a good year behind them (shipments in 1958 were 20 per cent better than in 1957), galvanized sheet producers are confident they'll do as well in 1959. Many are booked solid for the first quarter, and some expect capacity operations through the first half. This year's big markets will be housing (heating, air conditioning, ventilation, eaves, and downspouts) and farms (buildings, grain storage bins, feeders, and brooders).

BUYERS CAUTIOUS— Except for cold-rolled and galvanized sheets, consumers are buying on minimum leadtime, which makes it hard for mills to project their operations. Says a Chicago steelmaker: "We're about half booked at the start of a new month. By the end, we're 75 per cent booked—which means that a third of our tonnage comes in just in time to get on the schedule." Although consumers expect better business this year, they are hesitant about switching from short range procurement policies.

TUBEMAKERS SEE PICKUP— "Oil country goods are on the brink of recovery, and we're ready for it," a major producer declares. "We've been building up our downriver stocks." Citing a pickup in drilling activity, another firm announces it will operate its seamless pipe mill 20 turns a week. First quarter sales of the industry will probably surpass those of any 1958 quarter.

UTILITY TAKES NO CHANCES— To protect itself against a midyear steel strike, East Ohio Gas Co., Cleveland, is asking suppliers to ship 90 per cent of its pipe requirements in the first six months of the year. (It's buying 22,000 tons of pipe for distribution, transportation, and storage area lines.) In 1958, the company ordered 90 per cent of its pipe at the beginning of the year but asked that delivery be spread over 12 months.

STEELMAKER REVISES PRICES— Allegheny Ludlum Steel Corp. increased its base prices on stainless steel bars, wire, forgings, and forging billets about 3¾ per cent on Jan. 7. (Crucible Steel Co. took similar action in December.) At the same time, Allegheny announced:

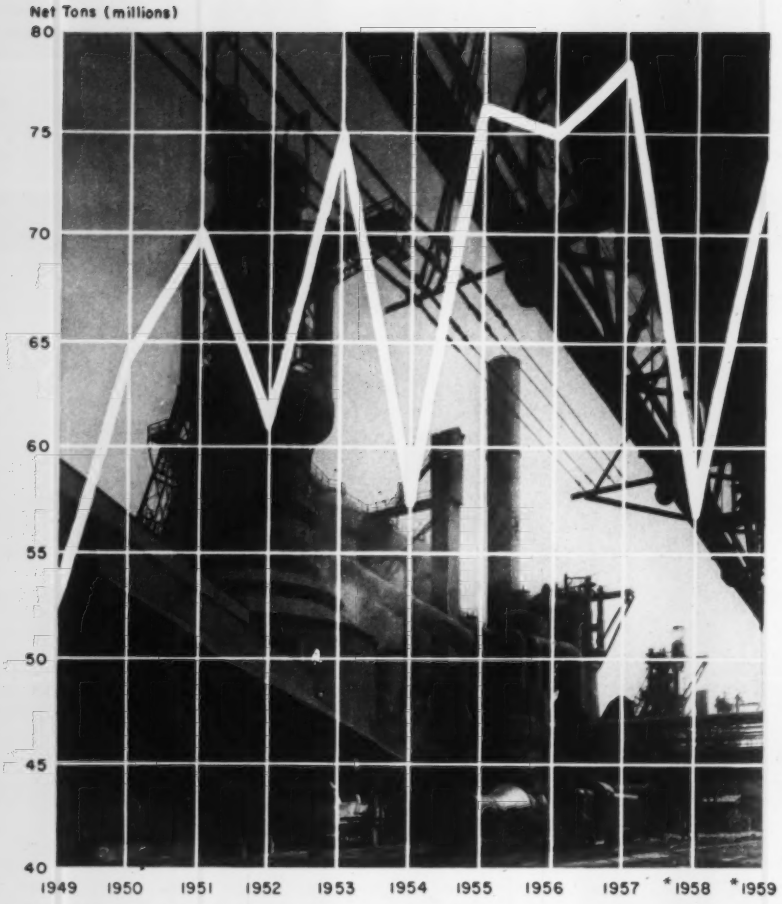
1. Slight reductions on sheet and strip forms of two low carbon stainless grades (304-L and 316-L).

2. Substantial reductions (11 to 14 per cent) on some air melted, alloy steels (X-200, 300-M, SAE-4335V) used primarily in missiles.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Alloy Steel	96	...
Bars, Merchant	93	98
Reinforcing	...	99
Boiler Tubes	...	101
Clad Steel	...	102
Coke	107	104
Coal Chemicals	...	104
Charts:		
Finished Steel	...	97
Ingot Rate	96	...
Scrap Prices	...	107
Comparisons	...	97
Contracts Placed	114	...
Contracts Pend.	114	...
Electrodes	...	104
Fasteners	96	101
Ferroalloys	...	*
Fluorspar	...	104
Footnotes	...	101
Imported Steel	...	104
Ingot Rates	96	...
Metal Powder	...	104
Nonferrous Met.	110	112
Ores	...	104
Pig Iron	96	103
Piling	...	98
Plates	93	98
Plating Material	...	113
Prestressed Strand	...	*
Price Changes	113	...
Price Indexes	...	97
Producers' Key	99	...
R.R. Materials	...	101
Refractories	...	104
Scrap	106	108
Semifinished	...	98
Service Centers	113	103
Sheets	93	99
Silicon Steel	...	100
Stainless Steel	...	102
Strip	93	100
Structurals	114	98
Tin Mill Prod.	93	100
Tool Steel	93	102
Tubular Goods	96	102
Wire	...	100

*Current prices were published in the Jan. 5 issue and will appear in subsequent issues.



Source: American Iron & Steel Institute.
*Estimated by STEEL.

Upswing in Pig Iron Gains Momentum

Growth in consumer durable goods sales sparks improvement in outlook. Don't expect a record sales year, but shipments should be well above 1958 levels

LOOK FOR a moderate resurgence in pig iron in 1959. Production will be below the 1957 peak of 78,375,378 net tons but ahead of the estimated 56.5 million tons for the year just ended.

Suppliers base their optimism on brighter prospects in steelmaking and metalworking. Estimates of 1959 ingot production average about 110 million tons, compared with about 85 million tons in 1958. Pig iron output will gain in about the same proportion.

• **Autos Lead the Way**—Best increase in demand will come from automotive customers, says one large producer. Another, pointing to the improvement already taking place, declares: "If automakers can sell from 5.5 million to 6,250,000 cars in 1959, our business will be definitely better."

• **Other Major Markets**—The outlook for agricultural equipment, heavy construction, and housing continues encouraging. A good market to watch is cast pipe, reports one seller. He believes that the growth in population and steady moves to the West and Southwest, where water is in short supply, will result in a firm demand for cast iron pipe.

Capital goods requirements will improve slowly this year. Following a dip of around 50 per cent in 1958, machine tool sales are expected to increase over 25 per cent in 1959. Heavy mill equipment demand, off appreciably last year, will also move slowly upward. Consumer goods requirements will probably accelerate more quickly in line with the pattern of the last several months.

Pickands Mather & Co., Cleveland, is preparing for better business in 1959. "The best quarter last year was the fourth. We expect to operate in 1959 at about the rate of that period. We aren't shipping 100 per cent of our capacity. We're stocking up on some specialties," reports a representative.

Deliveries of pig iron in the Chicago area are at their best rate since late 1957, as automakers increase their production, nonintegrated steelmakers buy more pig, and producers turn out more ingot molds.

• **Strong Finish in 1958**—The peak for pig iron last year came in the fourth quarter for most producers. October's output of 5,872,958 tons (including 36,963 tons of ferromanganese and spiegel) was the highest since October, 1957. November production was still higher at 5,946,163 tons (including 39,275 tons of ferroalloys). Total for the first 11 months was 51,691,210 tons (including 417,951 tons of ferroalloys). That's 62.1 per cent of capacity. December output was about 5.5 million tons.

In addition to an estimated 56.5 million tons of pig iron made in 1958, blast furnaces produced about 475,000 tons of ferroalloys, compared with over 963,500 tons in 1957. An estimated 1,025,000 tons of ferroalloys came from electric furnaces, against 1,459,353 tons in the preceding year.

• **Capacity Increases** — Blast furnace capacity reached a record high

of 94.6 million tons on Jan. 1, 1959, compared with 91 million one year earlier and 86.6 million on Jan. 1, 1957. (For steel ingot capacity figures, see Page 35.)

Shipments of merchant iron during the first ten months of last year reached 3,333,436 tons, reports the American Iron & Steel Institute, New York. Deliveries were off over 38 per cent from the same period in 1957. Some 817,135 tons went to producers of steel ingots and ingot molds. In the same period of 1957, these consumers took about 44 per cent more.

Foreign competition affected seaboard producers severely despite a slackening in imports in the first eight months of 1958. Already suffering from lagging sales, they found foreign products undercutting their prices by $10 a ton or more. Arrivals during the first eight months last year accounted for 93,552 tons, compared with 133,288 tons for the corresponding period of 1957. During the closing months of 1958, gains were shown in tonnage from West Germany as well as offerings of Dutch iron for the first time in several years. Canada continues to be by far the largest exporter of iron to this country.

• **Exports Exceed Imports** — The U. S. exported 95,663 tons during the first eight months of 1958. Some 54,006 tons went to India, which received 199,347 tons in 1957. No shipments went to Japan, which in 1957 took 587,872 tons of a total of 879,652 tons exported during the entire year.

In predicting 1959 sales, pig iron producers point to an encouraging trend—greater use of hot metal proportionally in the open hearth charge. Pig iron production increased by 2 per cent between 1955 and 1957 while ingot production fell 4 per cent between those years.

Tool Steel . . .

Tool Steel Prices, Page 102

Shipments of high speed and tool steel (excluding hollow drill steel) in November totaled 6601 net tons, reports the American Iron & Steel Institute. In the preceding month the total was 7217 tons, and in November, 1957, it was 7056 tons.

During the first 11 months of 1958 shipments amounted to 63,435 tons, down sharply from the 92,002 tons shipped in the corresponding 1957 period.

Steel Bars . . .

Bar Prices, Page 98

Market opinion regarding the trend of bar demand is mixed. Observers at some points note steady improvement; at others, no particular change in consuming pressure is sensed.

Business is expanding slowly in the East, but is disappointing. Orders are small, but diversified. Auto needs have shown little life—either directly or indirectly. But producers expect a fairly active first quarter, especially should automotive requirements pick up.

Midwestern barmakers can use more business, but they don't see much chance of getting it until the auto industry steps up production. The market is noticeably more competitive, partly because bar capacity has been expanded the last year or so. Wisconsin Steel Div., International Harvester Co., is opening sales offices in Milwaukee and Moline, Ill., areas formerly served from the Chicago office.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 99 & 100

Sheets are pacing the steel markets, thanks to heavy consumption by the automotive, appliance, and construction industries. Some producers are quoting late February or early March deliveries on cold rolled.

"Orders are firming up about as expected," a Pittsburgh sheet sales executive comments. "There's nothing extraordinary to report—just good consumption right across the board. We don't think leadtime will stretch beyond eight weeks unless users get excited about a possible strike."

January shipments are expected to be as good as last month's, or slightly better. Bookings are on the upgrade, even though little change has taken place in the volume of auto orders. Auto builders seem committed to a tight inventory policy, and won't consider inventory buildup until they're more certain of the '59 auto sales trend.

Except for cold rolled and galvanized sheets, midwestern consumers are buying within minimum leadtime. That makes it difficult for mills to project operations. One area mill finds that at the start of a new month it is only half booked up, but the month ends with books three-fourths full. That means 50 per cent of the tonnage comes in just in time to get into rolling schedules.

Hot rolled sheets are readily available, with leadtime pegged at three to four weeks. Deliveries of cold rolled average five to six weeks. Galvanized bookings extend through the first quarter, and the mills, barring a few exceptions, haven't opened their books for second quarter delivery. The exceptions are taking limited tonnage for delivery then. The mills' delivery position on electrical and enameling sheets is tightening, though some tonnage is still available for early February shipment.

Inland Steel has not brought its new cold rolling facilities up to full capacity as rapidly as had been expected. Having booked tonnage on the basis of its full availability, some December orders are being filled about three weeks later than originally intended. January production will probably equal January commitments, but won't be enough to catch up on arrears.

Tin Plate . . .

Tin Plate Prices, Page 100

Demand for tin plate is picking up following the lull in November and December—consumers filled their needs prior to the Nov. 1 price increase. Canners normally buy more heavily in the first half than in the second, and they are counting on 1959 being a good year.

Plates . . .

Plate Prices, Page 98

While fairly brisk demand for plates is noted in some midwestern markets, over-all business continues sluggish, with most mills still offering deliveries of sheared plates in two to three weeks. Indications are, though, that deliveries will become more extended as the quarter advances.

Some big orders are anticipated, reports a Pittsburgh mill executive. "If we get them," he said, "we'll have a hard time accommodating our smaller customers."

(*Please turn to Page* 96)

CARPENTER DOUBLES PRODUCTION CAPACITY

STEEL

behind the news . . . this unprecedented move:

In a nation famed for its mass-production techniques, it is rare to find the company whose chief problem for almost 70 years has been one of *supply* rather than *demand*.

Yet the industry requirements for *Carpenter*-quality specialty steels have, in times of normal economy . . . always exceeded *Carpenter's* ability to produce.

In contrast to the giants of the steel world . . . the steels of battleships, bridges and buildings . . . *Carpenter* history is one of precision rather than might—fine quality for critical applications, rather than mammoth quantity.

Today, as the result of long-planned expansion and new acquisitions, we can offer *quantity* along with famous *Carpenter quality*. Both are now available and will continue to be available, even in times of peak demand.

While *quality* will continue to remain a sacred watchword, we will continue to lead the way and grow apace of the ever-increasing demands of atomic-age industry for the world's finest steels.

tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

***Carpenter* steel**

The Carpenter Steel Company
Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

(*Concluded from Page 93*)

Wide plates are in strong demand at Pittsburgh, and December bookings of producers at that point were the best of any month in 1958. January sales and shipments will parallel those in December, mill officials think.

Tubular Goods . . .

Tubular Goods Prices, Page 102

An active first half, 1959, is shaping up in the tubular goods market. At Pittsburgh, a major producer thinks oil country goods are on the brink of recovery. This company is ready for it; it's been building up its downriver stocks.

Demand for drill pipe, tubing, and casing is improving, and first quarter sales are expected to top those in any 1958 quarter. Inventories of bread-and-butter items are close to bedrock. In the last few weeks, four large oil companies entered the market.

Current buying is for inventory replenishment. Considerable hedging, particularly in second quarter, is forecast in anticipation of a mid-year steel strike.

Action of East Ohio Gas Co. (it supplies natural gas to northeastern and eastern Ohio) in requesting deliveries in the first six months of the year on 90 per cent of its 1959 pipe needs provides a tipoff of what to expect with respect to deliveries in the first half.

East Ohio will purchase 22,000 tons of pipe this year. It will be used for distribution, transportation, and storage area lines. Last year, the company ordered 90 per cent of its needs at the start of the year, but spread out deliveries over the entire year.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 101

Pittsburgh Screw & Bolt Co., Pittsburgh, is aiming at establishment of a new fastener pricing schedule by late January. Last October, the company suggested to its customers a major overhaul of fastener pricing (STEEL, Oct. 27, 1958, p. 114).

The proposed structure would reflect prices as they are, but would be arrived at by a different and simpler method. One feature: Customers would be able to check net delivered prices quickly, without having to resort to complicated calculations and use of discount lists.

The Pittsburgh company has had no adverse customer reaction to the proposal.

A 30 per cent price reduction on studs for the VP stud hammer was announced recently by Velocity Power Tool Co., Pittsburgh.

Pig Iron . . .

Pig Iron Prices, Page 103

Foundries are anticipating a marked improvement in the flow of orders in the first quarter from the automotive industry, railroad equipment builders, appliance manufacturers, and other large users of castings.

Suppliers of merchant iron report receipt of slightly larger orders for delivery early this year, but they do not expect any sharp spurt. Although inventories at consuming points are low, buying is almost entirely for immediate needs.

At the end of November 204 blast furnaces were operating, 193 in the U. S. and 11 in Canada, reports the American Iron Ore Association. On the same date in 1957 there were 206 stacks active, 194 in the U. S. and 12 in Canada.

Alloy Steel . . .

Production of alloy steel ingots (other than stainless and heat resisting) totaled 606,287 net tons in November, reports the American Iron & Steel Institute. Of the total, 584,723 tons were without boron, and 21,564 tons were with boron.

In the first 11 months of 1958, output amounted to 5,060,896 tons (199,201 tons with boron, and 4,861,695 tons without). The breakdown for November and the first 11 months:

Production of Alloy Steel Ingots
(Other than stainless and heat resisting)
(Net tons)

Grades	November	First 11 Months, 1958
Carbon boron	1,273	11,719
Nickel	2,551	39,547
Molybdenum	52,614	426,014
Manganese	18,173	146,725
Manganese-Molybdenum	22,986	176,140
Chromium	108,396	849,967
Chromium-Vanadium	3,987	38,199
Nickel-Chromium	5,768	61,430
Nickel-Molybdenum	28,441	218,633
Chromium-Molybdenum	72,839	601,610
Nickel-Chromium-Molybdenum	96,773	846,917
Silico-Manganese	7,018	59,012
All other	34,448	328,903
Subtotal	455,267	3,804,816
Other alloy:		
High strength steels	66,823	529,213
Silicon sheet steels	84,197	726,867
Total all grades	606,287	5,060,896

Data from American Iron & Steel Institute.

DISTRICT INGOT RATES
(Percentage of Capacity Engaged)

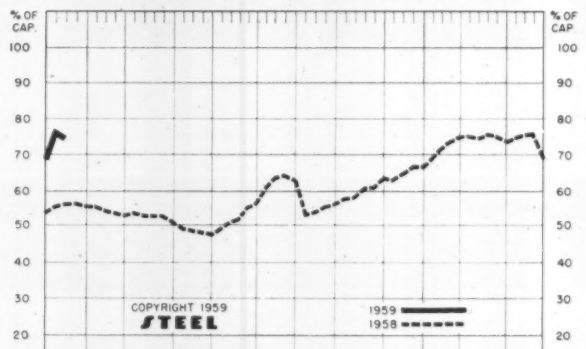
	Week Ended Jan. 11	Change	Same Week 1958	Same Week 1957
Pittsburgh	76	+ 4*	54.5	100
Chicago	91	+ 2.5*	64	98
Eastern	74	+ 3	77	102
Youngstown	65	+ 1	61	102
Wheeling	84	+ 5	55.5	98.5
Cleveland	86.5	+ 3.5*	48.5	92.5
Buffalo	66	0	53.5	107.5
Birmingham	70.5	— 2.5	62.5	94.5
Cincinnati	82	— 1	61.5	99.5
St. Louis	98	— 1.5*	86	95.5
Detroit	96.5	+ 2.5	66.5	101.5
Western	74	— 5.5	79	102
National Rate	74.5	§	56	98.5

INGOT PRODUCTION‡

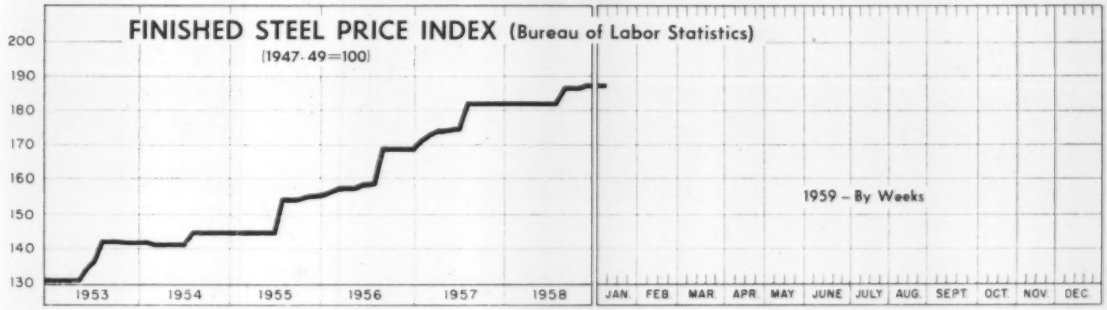
	Week Ended Jan. 11	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	131.3†	128.1	123.6	94.3
NET TONS (In thousands)	2,109†	2,058	1,985	1,515

*Change from preceding week's revised rate. §Start of new series based on 1959 capacity. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,486 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Jan. 6, 1959	Week Ago	Month Ago	Dec. Avg	Year Ago
186.9*	186.9*	186.9*	186.9*	181.7

*Revised.

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.561
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.695
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.531	Pipe, Black, Buttweld (100 ft)	19.903
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.583
		Pipe, Line (100 ft)	199.53
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	26.157	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.658
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 7 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.91
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	39.66	39.66	39.17	33.33	29.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Jan. 7 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Deld.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	Jan. 7 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$42.50	$42.50	$41.50	$32.50	$30.50
No. 1 Heavy Melt, E. Pa.	34.00	34.00	34.00	37.00	29.50
No. 1 Heavy Melt, Chicago	42.50	42.50	42.00	30.50	29.00
No. 1 Heavy Melt, Valley	43.50	42.50	42.50	29.50	29.50
No. 1 Heavy Melt, Cleve.	39.50	39.00	39.00	26.50	28.50
No. 1 Heavy Melt, Buffalo	35.50	33.50	33.50	29.50	27.50
Rails, Rerolling, Chicago	62.50	62.50	63.50	49.50	39.50
No. 1 Cast, Chicago	45.50	45.50	45.50	39.50	32.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, Jan. 7, cents per pound except as otherwise noted. Changes shown in italics. Code number following mill points indicates producing company. Key to producers, page 99, footnotes, page 101.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B3 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ....99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....113.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5; W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32 ..119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
Indiana Harbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
N. Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.45
Indiana Harbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W144..6.80

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Struthers,O. Y1 ....8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, ALLOY
Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L17 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 ....7.50

FLOOR PLATES
Cleveland J5 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ....6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 N5.675
Aliquippa,Pa.(9) J5 ..5.675
Alton,Ill. L1 ....5.875
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ..5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 ....5.675
KansasCity,Mo.(9) S5 ..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle B3, N14 ....6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 ..5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 ....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ....5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Loaded (Including loaded extra)

Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 ....8.25
Buffalo B5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.85
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putman,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
WillimanticConn. J5 ....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
CumberlandMd. (5) .C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O W8 ....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 ....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ..9.325
Massillon,O. R2, R8 ...9.025
Midland, Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N. J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025
Warren,O. C17 ....9.025
Waukegan,Ill. A7 ....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ..9.325
Youngstown F3, Y1 ..9.025

BARS, Reinforcing, Billet (To fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft. Worth,Tex.(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ...5.675

BARS, Reinforcing, Billet (Fabricated; to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00

BARS, Rail Steel

ChicagoHts.(3) C2, I-2.5.575
ChicagoHts.(4)(44) I-2.5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ....5.575
Franklin,Pa.(4) F5 ....5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa, Pa. J5 ....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1.7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland, Ky.(8) A10....5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ...6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1.6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 .....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ...6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1.9.275
Lackawanna(37) B2 ...9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 .6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
SparrowsPt.(39) B2 ..10.025
Pittsburgh J5 .....10.125

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Youngstown J5 .....7.50
Weirton,W.Va. W6 ....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 2) 9.625
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2,Y1.6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke. Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simmons Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am.Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle (25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2,Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.85	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23.30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
New York W3	...	...	18.85	22.95	27.80
Palmer,Mass. W12	...	...	18.85	....	....
Trenton,N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	...	18.85	22.95	27.80
Youngstown S41	...	...	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)

Aliquippa,Pa. J5	7.90	8.10	...
Niles,O. R2	7.90	8.10	8.30

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.25
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05
Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

Grain Oriented	T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W2	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Sterling,Ill. (1) N15	177
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill. (7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa. 9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa. (43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill. (7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.75
Cleveland A7	17.85	....
Craw'dsville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
Sterling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48) A11	9.10	9.775§
Bartonville(48) K4	9.10	9.775
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown B2(48)	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) C16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen (48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48) B2	9.10	9.775§
Sterling(48) N15	9.25	9.925††
St'ling(1)(48) N15	9.15	9.825††
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass. A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts

(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

STEEL, ANN	5pt	CLEM	12-8

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

⅜ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head,

Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85 and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¼	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Standard All	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.50
Johnstown,Pa. B2	....	....	....	(16) 6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.22
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	7.025
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 9.025" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+7.75
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	0.5	+28	+11.5	+37	+22	+45.5	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.25	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	39.25	43.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	53.50	53.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75
316L	....	....	70.00	76.50	77.00	80.75	79.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp., Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
*Copper**	35.55	42.05

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.50*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill R2	66.00	66.50	66.50	67.00
S. Chicago, Ill W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
Neville Island, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKees Rocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
Granite City, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Calvert City, Ky. P15	$99.00
Niagara Falls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk, Iowa O.H. & Fdry, 12½ lb pigiets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Neville Island, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††‡		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.99
Boston	9.31	10.40	11.97	53.50	9.73	10.11	13.39#	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.68
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.06	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.55	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.26	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.48
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	11.10	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	11.34	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.09	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.35	11.55	12.55	57.38	10.80	11.05	14.70	16.80	10.25	10.15	13.05
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **½ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [5]—1000 to 4999 lb; [6]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $145; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: 98% Fe: f.o.b. Camden or Riverton, N. J., freight allowed east of Mississippi river, ocean bags, 23,000 lb and over	11.25
Sponge Iron, Domestic, 98% Fe: Deld. east of Mississippi River 23,000 lb and over	11.25
100 mesh	9.10
40 mesh	8.10
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microne, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.00-48.90†
Bronze, 5000-lb lots	49.60-53.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	50.99-55.40†
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡

Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.10	$5.10	$5.00	$5.45
Bar Size Angles	5.00	5.00	4.90	5.33
Structural Angles	5.00	5.00	4.90	5.33
I-Beams	5.06	5.06	4.96	5.40
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.60	6.60	6.60	6.95
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.15	5.28	5.10	5.45
Wire Rods, O.H. Cold Heading Quality No. 5	6.05	6.18	6.00	6.30
Bright Common Wire Nails (§)	7.89	7.75	7.67	8.26

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.25-$12.50*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00

South African Transvaal

44% no ratio	22.00-23.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.18
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal., f.o.b. tank cars or tank trucks, plant

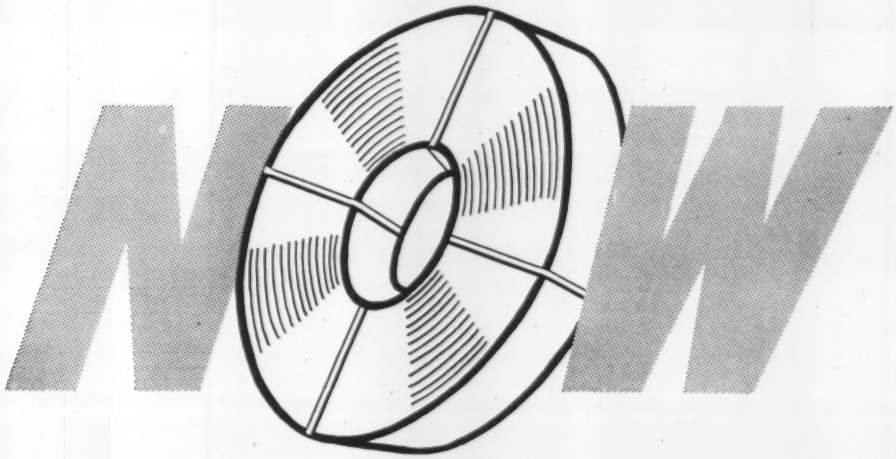
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	22.00
Naphthalene, 78 deg	7.00
Toluene, one deg. (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, del.

Phenol, 90 per cent grade	15.50

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$42.00



CHASE IS ROLLING SHEET ALUMINUM

. . . and Chase as your aluminum source gives you all these advantages!

LONG EXPERIENCE – For years Chase has been rolling aluminum for special applications, along with other metals, giving Chase unrivalled non-ferrous metals experience...82 years working with metals!

LATEST EQUIPMENT for quality production and exacting production techniques assure close tolerance controls required in narrow-width rolling of aluminum for use in fin stock, in deep drawing, and spinning and in eyelet parts.

HUGE STOCKS of semi-finished aluminum at Chase Cleveland and Waterbury mills assure you quick delivery of coiled sheet to meet your exact needs.

DEPENDABLE SUPPLY – because Chase can draw on unlimited stocks of raw metal.

* * *

Talk over your requirements with your Chase District Office, or write Chase, Waterbury 20, Connecticut.

From ½" to 18" width in 90 to 110 lb./inch coils

Mill Stocks of These 6 Alloys On Hand In Waterbury and Cleveland Mean Quick Service

1100	**3003**	**3004**
5005	**5050**	**5052**

Chase®

BRASS & COPPER CO.

WATERBURY 20, CONN.

Subsidiary of

Kennecott Copper Corporation

THE NATION'S HEADQUARTERS FOR **ALUMINUM • BRASS • BRONZE • COPPER • STAINLESS STEEL**

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

Scrap Marking Time in Slow Market

STEEL's composite on the prime grade holds unchanged at $39.66 for the third straight week. Buying still limited, but heavier demand is expected as first quarter advances

Scrap Prices, Page 108

Pittsburgh—Trading is negligible, but the market is firm. Brokers think prices will edge up in the next few weeks. Mills will be under little pressure to buy unless their customers start hedging against a possible steel strike. Railroad lists are closing higher. The B&O sold No. 1 heavy melting at $45.50, up $1.35 from last month's price.

Chicago—Although steelmaking operations are at the highest level since early 1957 and are certain to go higher in the next few weeks, the effect on the scrap market is nil. In fact, a slight weakness is detected. Three factors are combining to cause the bearishness. First, with metalworking activity moving along at a good clip, scrap is being generated at a rate in excess of purchases for consumption. Second, only a few mills are buying. Third, only 35 of the district's 43 blast furnaces are active; hot metal supply can be increased readily as needed.

Philadelphia—Practically no material is moving in this district, and prices are unchanged. They're far under those quoted at Pittsburgh and Chicago and material is moving from here to other areas, notably Pittsburgh.

New York—The market continues quiet but dealers anticipate an early pickup in demand on the basis of reports that customers are more optimistic than they were last month.

Panama Canal Co., New York, opens bids Feb. 13 on 7070 tons of ferrous scrap, including 3500 tons of No. 1 heavy melting steel.

Cleveland—Heavier buying since the start of the year has raised prices on the No. 1 grades about 50 cents a ton. No. 1 heavy melting is now quoted at $39-$40. Steel on automotive lists is moving, with No. 1 factory bundles quoted at $43-$44. In the Valley, a district mill paid $46 for No. 1 heavy melting industrial scrap, raising the price on No. 1 dealer material $1 to $43-$44.

Detroit—Dealers and brokers are enjoying a sudden spurt in market activity, which was triggered by a Ford order last week. Dealers are doing speculative trading among themselves, and the feeling is that the activity will strengthen the local market over the next three months.

No. 1 grades are up $1 to $2 a ton. Turnings show a sympathetic increase, being up $1.

Buffalo—A leading local consumer, which traditionally buys large tonnages of No. 2 bundles in the dealer market every month, will make no purchases of that grade for January delivery.

Cincinnati—The market is up $1 a ton on the principal steelmaking grades, reflecting purchases by a district mill. Brokers have raised their buying prices $2 a ton over

ANOTHER PANNIER MASTER MARKER!

PANNIER'S STEEL LETTERS • FIGURES

- Longer lasting, less mushrooming
- Better impressions—clear, clean
- Letters, figures, or symbols
- In sets, assorted, or singly

Pannier Tested Steel Stamps provide you with clear, clean markings, maximum safety, longer life and highest quality.

BIRTHMARKED MATERIALS

Write for data. Wide variety of sizes available.

MARKING MASTER PANNIER MARKERS DEVICES

THE PANNIER CORPORATION

220 Sandusky Street • Pittsburgh 12, Pa.

Offices: Los Angeles • Chicago • Cleveland • Philadelphia • Birmingham

If

METALWORKING PLANTS ARE YOUR PROSPECTS...

✓ ✓ ✓

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, O.

the last couple of weeks, now quoting No. 1 heavy melting at $38-$39.

St. Louis—Despite a drop of $1 to $2 a ton in prices on various railroad scrap items, the scrap market here shows a strong undertone. Sales are mainly confined to open hearth and cast iron grades. A lot of material is being taken by processors and the trade generally looks for a price advance soon.

Birmingham — A few foundries bought limited amounts of cast iron scrap during the holiday period, but most consumers continued out of the market.

Houston—Supply surpluses continue to build up here. A limited purchase by the local mill is providing the only activity of any consequence in the market, but there's talk some Gulf Coast scrap will move to Japan during the first quarter.

San Francisco—Some dealers anticipate a downturn in prices here over coming weeks. They say mill purchases will be small this month.

Los Angeles—Some dealers anticipate a $2 to $3 a ton drop in prices shortly. Demand for scrap has lagged behind steelmaking.

Seattle—Dealers are marking time pending a pickup in consumer demand. Large buyers have not yet announced their buying prices for January, and, as a result, current quotations are nominal.

Toronto, Ont. — One hundred sixty steam locomotives will be scrapped by the Canadian National Railways over the winter months. Demolition will be at the Stratford, Ont., shops.

Metallurgical Coke . . .

Production of coke (oven and beehive) in October totaled 5,107,768 net tons, reports the U. S. Bureau of Mines. Of the total, 5,046,197 were oven coke and 61,571 beehive. In September, output totaled 4,505,379 tons (4,450,171 oven, 55,208 beehive). Output in October, 1957, was 6,289,400 tons (6,166,000 oven, 123,400 beehive).

Output for the first ten months last year totaled 42,737,125 tons (42,311,162 oven, 425,963 beehive). In the like 1957 period the total was 65,141,900 tons (63,222,700 oven, 1,919,200 beehive).

Stocks of oven coke held by producers at the end of October amounted to 3,896,260 tons, equal to 23.9 days' production. That compares with 2,763,957 tons, or 13.3 days' production, at the end of October last year.

Wire . . .

Wire Prices, Pages 100 & 101

Foreign competition in wire products continues severe at many market points throughout the country —especially so along the seacoasts. Los Angeles sellers report Japanese and German wire items are hurting sales of domestic wire products. Fourth quarter district sales were down about 10 per cent from the third quarter's, with imports cutting into domestic volume in nails, stucco netting, and concrete reinforcing mesh.

Punches & Dies
Since 1903
Made to highest standard and uniform quality thus insuring maximum service.
Rivet sets—round, square, oblong Punches, and Dies carried in stock.
Write Dept. A for catalog 60 and new stock list.
GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET · CHICAGO 8, ILLINOIS

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Jan. 7, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 7	$39.66
Dec. 31	39.66
Dec. Avg.	39.47
Jan. 1958	34.10
Jan. 1954	29.05

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	42.00-43.00
No. 2 heavy melting	35.00-36.00
No. 1 dealer bundles	43.00-44.00
No. 2 bundles	31.00-32.00
No. 1 busheling	42.00-43.00
No. 1 factory bundles	*48.00-49.00*
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut structurals:	
2 ft and under	*49.00-50.00*
3 ft lengths	*48.00-49.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*49.00-50.00*
Electric furnace bundles	*49.00-50.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.00-47.00*
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Random rails	53.00-54.00
Railroad specialties	48.00-49.00
Angles, splice bars	48.00-49.00
Rails, rerolling	58.00-59.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt, indus.	43.00-44.00
No. 1 heavy melt dealer	41.00-42.00
No. 2 heavy melting	35.00-36.00
No. 1 factory bundles	46.00-47.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	29.00-30.00
No. 1 busheling, indus.	43.00-44.00
No. 1 busheling, dealer	41.00-42.00
Machine shop turnings	21.00-22.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut structurals, 3 ft	47.00-48.00
Punchings & plate scrap	48.00-49.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	43.00-44.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	52.00-53.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt	45.00-46.00
R.R. malleable	57.00-58.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Angles, splice bars	54.00-55.00
Axles	69.00-70.00
Rails, rerolling	62.00-63.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	45.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	29.00-30.00
No. 1 busheling	*43.00-44.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	29.00-30.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos	43.00-44.00
Electric furnace bundles	43.00-44.00

Railroad Scrap

N. 1 R.R. heavy melt.	44.00-45.00

CLEVELAND

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	25.00-26.00
No. 1 factory bundles	43.00-44.00
No. 1 bundles	*39.00-40.00*
No. 2 bundles	28.50-29.50
No. 1 busheling	*39.00-40.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	39.00-40.00
Cut structurals, plates 2 ft and under	47.00-48.00
Low phos, punching & plate	40.00-41.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	63.00-64.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	205.00-215.00
18-8 turnings	115.00-120.00
430 clips, bundles, solids	110.00-120.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	37.00
No. 2 heavy melting	35.00
No. 1 bundles	39.00
No. 2 bundles	27.00
No. 1 busheling	39.00
Machine shop turnings	18.50†
Short shovel turnings	20.50†

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	48.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*42.00†*
Rails, 18 in. and under	51.00†
Rails, random lengths	*46.50†*
Rails, rerolling	*58.00*
Angles, splice bars	47.00

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	35.00-36.00
No. 2 bundles	21.00-22.00
No. 1 busheling	35.00-36.00
Cast iron borings	13.00-14.00
Machine shop turnings	21.00-22.00
Short shovel turnings	22.00-23.00
Bars, crops and plates	42.00-43.00
Structurals & plates	41.00-42.00
Electric furnace bundles	37.00-38.00
Electric furnace:	
2 ft and under	36.00-37.00
3 ft and under	35.00-36.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	52.00-53.00
Unstripped motor blocks	40.00-41.00
Charging box cast	29.00-30.00
No. 1 wheels	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-39.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	54.00-55.00
Rails, random lengths	44.00-45.00
Angles, splice bars	45.00-46.00

PHILADELPHIA

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	35.00
No. 2 bundles	24.50
No. 1 busheling	34.00
Electric furnace bundles	37.00
Mixed borings, turnings	18.00†
Short shovel turnings	21.00-22.00
Machine shop turnings	18.00
Heavy turnings	30.00
Structurals & plate	39.00-40.00
Couplers, springs, wheels	42.00-43.00
Rails, crops, 2 ft & under	56.00-57.00

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	41.00
Malleable	62.00
Drop broken machinery	48.00-49.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	27.00-28.00
No. 2 bundles	17.00-18.00
Machine shop turnings	9.00-10.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	33.00-34.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Unstripped motor blocks	23.00-24.00
Heavy breakable	31.00-32.00

Stainless Steel

18-8 sheets, clips, solids	185.00-190.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	75.00-80.00

BUFFALO

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*35.00-336.00*
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	42.00-43.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	47.00-48.00
Rails, 3 ft and under	53.00-54.00
Railroad specialties	42.00-43.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*38.00-39.00*
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	19.00-20.00
Low phos, 18 in.	46.00-47.00

Cast Iron Grades

No. 1 Cupola	45.00-46.00
Heavy breakable cast	*39.00-40.00*
Charging box cast	38.00-39.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	*43.00-44.00*
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	49.00-50.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	33.00
No. 2 bundles	23.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	39.00†

Cast Iron Grades

No. 1 cupola	*42.00*
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	33.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00†

BOSTON

(Brakers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	25.00-26.00
No. 1 busheling	25.00-26.00
Machine shop turnings	7.00-8.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*22.50-23.50*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	15.00-16.00
Punching & plate	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	*33.00-34.00*
Charging box cast	*33.00-34.00*
Heavy breakable	35.00-36.00
Unstripped motor blocks	*22.00-23.00*
Clean auto cast	49.00-50.00

SEATTLE

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	29.00
No. 2 bundles	23.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	33.00
No. 2 heavy melting	35.00
No. 1 bundles	34.00
No. 2 bundles	20.00
Machine shop turnings	15.00
Shoveling turnings	18.00
Cast iron borings	15.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

SAN FRANCISCO

No. 1 heavy melting	32.00-34.00
No. 2 heavy melting	30.00-32.00
No. 1 bundles	30.00-32.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

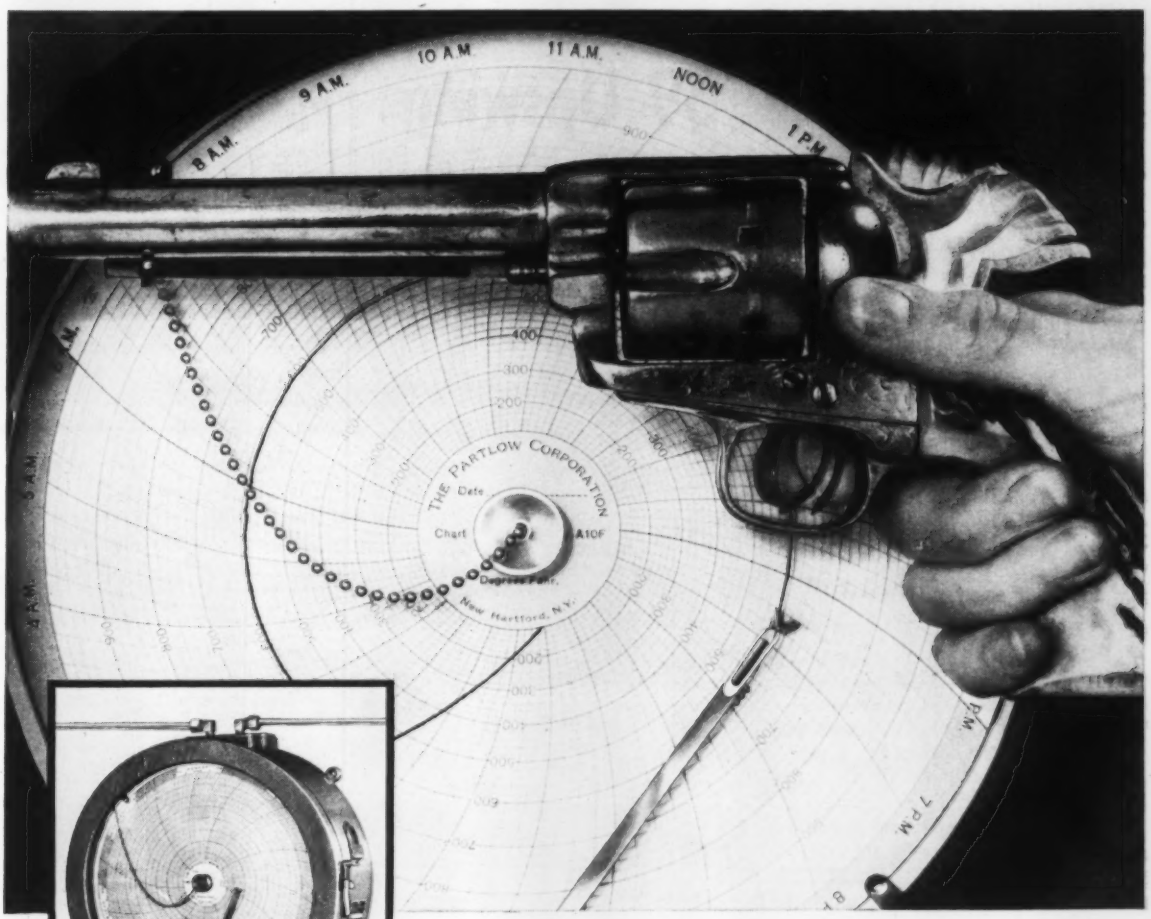
No. 1 heavy melting	34.50
No. 2 heavy melting	30.50
No. 1 bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	26.50
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	34.50
Unprepared	28.50
Short steel turnings	19.00

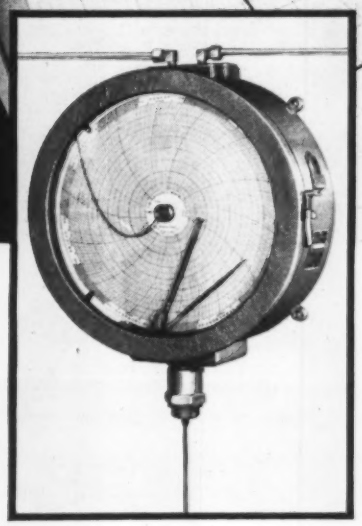
Cast Iron Grades‡

No. 1 machinery cast	39.00-41.00

†Nominal.

‡F.o.b. Hamilton, Ont.





The Control Geared for

HAIR TRIGGER RESPONSE

even to Fractional Changes in Temperature!

NEW *Recording Pneumatic Temperature Control, Model RVA, available in any of 10 ranges from -30° to 1100° F.*

Extreme sensitivity—reflected in lightning-fast reaction to temperature changes—is a characteristic of *all* Partlow controls. Partlow Recording controls, however, *prove it in writing* . . . You can see for yourself how exceptional bulb sensitivity, teamed with advanced mechanical design, provide a minimum of "saw-toothing" on start-up, and maintain a rigid line of control when temperature reaches a predetermined set point.

Instant response, of course, is just one of Partlow's many built-in advantages. Another is rugged *design simplicity* that does away with hair springs and delicate electronic gadgets . . . that requires no electronic amplification . . . that permits fast, "screwdriver" replacement of the thermal element *right out in the field.*

If you use or manufacture process equipment within the -30° to 1100° F. range, there's a Partlow Pneumatic, electric or self contained gas control to fit your application *precisely*. Recording, indicating and non-indicating models available. For full details write The Partlow Corp., New Hartford, New York, Dept. S-159.

Export Reps: Ad Auriema, Inc., 89 Broad St., New York 4, N. Y.

You can pay more but you can't buy better than

PARTLOW

TEMPERATURE CONTROLS

Metalmen See '59 Upswing

There's no boom, but most metals will continue the climb from the recession cellar. Fewer price fluctuations, more production, increased consumption mark outlook

Nonferrous Metal Prices, Pages 112 & 113

IF 1959 turns out as well as anticipated, there will be little gloom in the nonferrous industry over the next 12 months. It doesn't mean the last of the '50s will be a banner year, but it should hit close to the 1957 pace. The only cloud on the horizon is possible labor unrest.

Here's how the market shapes up for five metals (see STEEL, Jan. 5, p. 462, for 1959 outlook on aluminum and copper).

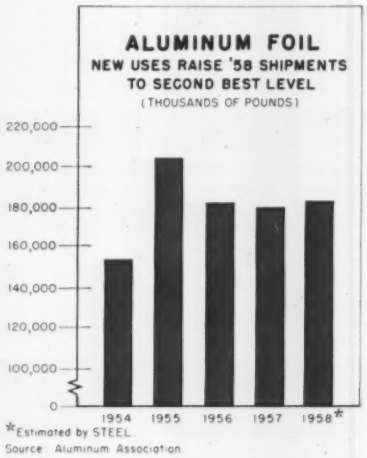
• **Zinc**—Sales will be up: Domestic shipments of slab zinc should reach 815,000 to 850,000 tons, compared with an estimated 776,000 tons in 1958. Observers believe U. S. consumption will jump by 10 per cent to 950,000 tons if Detroit produces 5.5 million cars and if the steel industry avoids a labor shutdown.

Production will rise: Domestic smelter output should hit 900,000 to 950,000 tons, vs. an estimated 820,000 tons in 1958. Domestic mine production of recoverable metal will probably be 400,000 to 450,000 tons. Stocks will continue to decline but at a more modest pace than in recent months. Quotas will hold up excessive imports.

Look for the zinc price to go up soon, probably by 0.5 cent a pound. If favorable business continues, it's likely that producers will put through a similar increase around midyear.

• **Lead**—Consumption in 1958 fell around 12 per cent to 1 million tons, estimates the Business & Defense Services Administration. More demand for replacement storage batteries, increased auto production, added sales to cablemakers, plus about the same market for tetraethyl lead, will boost 1959 consumption 5 to 10 per cent to 1.05 million to 1.1 million tons.

U. S. mine production will rise to about 300,000 tons, vs. an estimated 267,000 tons last year; secondary production should hit 430,000 tons, shading the 1958 estimate of 391,000; and quotas will hold imports to a maximum 350,000 tons, compared with 580,000 tons last year. This means 1959's domestic supply will hover close to 1.08 million tons, a drop from the 1959 estimate of 1.238 million tons.



Lead's position is still shaky. Stocks are too high. Any reduction will be gradual. The price may move down early this year.

• **Nickel**—Look for a steady uptrend in sales as this metal bounces back from its recession woes. Free World consumption in 1959 should rise from the 325 million to 335 million lb predicted for 1958 to near 1957's 412 million lb.

Free World production will be increased about 20 per cent to 400 million lb.

Expect prices to remain at present levels throughout the year.

• **Magnesium** — The metal's 1959 showing will be largely determined by military spending.

Early predictions peg a jump in consumption to around the 1957 level of 44,000 tons, vs. 37,000 tons in 1958; a dip in production to somewhere between 25,000 and 30,000 tons, vs. 30,000 tons in 1958. Reason: Large stocks of primary metal are unsold.

Mill shipments should show about a 10 per cent gain over estimated 1958 sales—9500 tons of wrought products and 13,000 tons of castings.

Don't rule out the possibility of a price move if business gets better. The current quotation has been in effect since Aug. 13, 1956.

• **Titanium**—The metal had a dismal year in 1958. Sponge production dropped to around 4500 tons, vs. 17,000 tons in 1957. Sponge consumption was about 3400 tons, vs. 8200 tons in 1957. Mill product shipments slumped more than 50 per cent to 2500 tons.

The 1959 market is pretty much geared to aircraft and missile spending.

Prices of mill products fell 10 to 12 per cent on Jan. 1. You may see at least one more dip in 1959.

NONFERROUS PRICE RECORD

	Price Jan. 7	Last Change	Previous Price	Dec. Avg	Nov. Avg	Jan., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	29.00	Dec. 22, 1958	28.75–29.00	28.856	29.415	25.135
Lead	12.80	Oct. 14, 1958	12.30	12.800	12.800	12.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	99.125	Jan. 7, 1959	98.875	99.019	99.034	92.933
Zinc	11.50	Nov. 7, 1958	11.00	11.500	11.386	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

puts that "want-to-buy" gleam in their eye

UNILOY
STAINLESS STEELS

The gleam in *her* eye reflects the brilliant beauty of stainless steel trim. The gleam in *his* eye reflects the protection that only stainless steel provides. Helps keep that "showroom look" for years.

Specify Uniloy stainless steel, produced by steelmakers who have been making specialty steels since 1884. This backlog of experience explains Uniloy's gleaming finish, why it is so easy to fabricate. For prompt delivery of Uniloy stainless steel rolled to your exact specifications, write or call our nearest sales office or warehouse.

UNIVERSAL CYCLOPS
STEEL CORPORATION
BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 29.00; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $218-221 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.90; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $52-55 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.00 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 99.125.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.),$1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.50; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 28.00; tin bronze, No. 225, 37.50; No. 245, 32.25; high-leaded tin bronze, No. 305, 32.25; No. 1 yellow, No. 405, 23.00; manganese bronze, No. 421, 24.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.54; l.c.l., 36.29.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $6.90-14.35; sheared mill plate, $5.00-8.50; wire, $5.50-9.50; forging billets, $3.55-4.10; hot-rolled and forged bars, $4.25-5.40.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H. R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 7300.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 22.50-23.00; No. 2 heavy copper and wire, 20.50-21.00; light copper, 18.25-18.75; No. 1 composition red brass, 16.50-17.00; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 29.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	53.13b	50.36c	....	53.39	25.000	25.000	24.250
Yellow Brass	46.57	31.22d	47.11	49.98	17.000	16.750	15.250
Low Brass, 80%	49.23	49.17	48.87	52.54	21.250	21.000	20.500
Red Brass, 85%	50.17	50.11	50.71	53.48	22.125	21.875	21.375
Com. Bronze, 90%	51.65	51.59	52.19	54.71	22.875	22.625	22.125
Manganese Bronze	54.98	48.58	59.08	....	17.750	17.500	16.875
Muntz Metal	49.35	44.66	....	....	17.875	17.625	17.125
Naval Brass	51.24	45.05	57.80	54.65	17.625	17.375	16.875
Silicon Bronze	58.27	57.46	57.81	75.95	24.625	24.625	23.625
Nickel Silver, 10%	62.20	66.60	64.03	....	23.875	23.625	11.987
Phos. Bronze	72.59	73.09	72.59	74.27	25.875	25.625	24.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting, e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 15.50-16.00; new brass clippings, 14.00-14.50; light brass, 10.50-11.00; heavy yellow brass, 11.50-12.00; new brass rod ends, 12.50-13.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 13.50-14.00; brass pipe, 13.50-14.00.

Lead: Heavy, 8.25-8.75; battery plates, 4.00-4.25; linotype and stereotype, 10.50-11.00; electrotype, 9.00-9.50; mixed babbitt, 9.50-10.00.

Monel: Clippings, 30.00-31.00; old sheets, 27.00-28.00; turnings, 22.00-23.00; rods, 30.00-31.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 4.00-4.25; new diecast scrap, 3.75-4.00; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 8.25-8.75; segregated low copper clips, 13.00-13.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 10.75-11.25.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 15.50-16.00; segregated high copper clips, 15.00-15.50; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.50-15.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 14.00-14.50; segregated high copper clips, 12.50-13.00; mixed low copper clips, 13.00-13.50; mixed high copper clips, 12.00-12.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 24.75; No. 2 heavy copper and wire, 23.25; light copper, 21.00; refinery brass (60% copper) per dry copper content, 22.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.75; No. 2 heavy copper and wire, 23.25; light copper, 21.00; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.00; yellow brass turnings, 12.00; radiators 14.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 46.79; oval, 45.00; 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00. 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.65; 2000-5900 lb, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 lb, 12.15; 23,000 lb or more, 11.65.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 78.00; 100-600 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 64.10; 10,000 lb or more, 62.80.

Stannous Chloride (anhydrous): 25 lb, 153.20; 100 lb, 148.30; 400 lb, 145.90; 800-19,900 lb, 105.00; 20,000 lb or more, 98.90.

Stannous Sulphate: Less than 50 lb, 138.40; 50 lb, 108.40; 100-1900 lb, 106.40; 2000 lb or more, 104.40.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

Selective Price Changes Made on Stainless, Alloys

Selective revisions in prices of some stainless and low alloy steel products were announced Jan. 6 by Allegheny Ludlum Steel Corp., Pittsburgh. The changes include increases and decreases.

Base prices of stainless steel bars, wire, forgings, and forging billets are increased about 3¾ per cent, in line with revisions announced by several other makers.

Allegheny made substantial reductions in prices of certain premium quality, air melted, alloy steels, used primarily in missiles. They bear such designations as X-200, 300-M, and SAE-4335V. The reductions range from 11 per cent to 14 per cent, and bring base prices of these special grades to: 64 cents a pound for bars; 62 cents for plates; 74 cents for sheets; 69 cents for forgings, and 54 cents for forging billets.

Slight reductions were made in prices of sheet and strip forms of two, low carbon, stainless steel grades, 304-L and 316-L. The reductions bring base prices of sheet and strip of these grades to: 62¾ cents per pound for 304-L, and 88½ cents for 316-L.

Superior Steel Div., Copperweld Steel Co., Carnegie, Pa., has revised its base prices on copper clad strip. It now quotes cold-rolled clad, 10 per cent, two sides, $42.05 per 100 pound; and cold-rolled clad, 10 per cent, one side, $35.55. Those prices cover phosphorus deoxidized copper clad, red brass, and gilding metal.

Another producer, Joslyn Mfg. & Supply Co., Ft. Wayne, Ind., has raised its base prices on stainless steel bars and wire 3.75 per cent. The action is similar to that taken early in December by the Crucible Steel Co. of America, Pittsburgh.

Distributors . . .

Prices, Page 103

Distributors expect no sharp spurt in business this month. They look for only a moderate recovery from the yearend lull. The movement is likely to gain momentum as general industrial activity picks up. Business will be stimulated especially by increased construction.

Steel service centers in the Hous-

FOR SALE

7000 gallon complete TANK CARS

Priced Attractively

Complete tank car or will remove tank. Can be inspected now at Kansas City.

Write • Wire • Phone

SONKEN-GALAMBA CORPORATION

2nd & Riverview
Kansas City, Kansas
ATwater 1-9305
X-358

WANT TO BUY

Steel By-Products Discs

2"	to 2⅛"	Diameter .060 to .125
4⅛"		Diameter .060 to .125
6⅛"	to 10"	Diameter .060 to .125
11"	to 12⅛"	Diameter .085 to .095

Hot or Cold Rolled

KEYSTONE LAMP MFG. CORP.

Purchasing Department

Phone Slatington, Pa. POrter 7-3821

WANTED
NATIONAL SALES OUTLET

Well established U. S. manufacturer desires to associate with a sales organization operating in the continental United States, and, preferably, its territories to handle the sale of a new type paint formulated to prevent the corrosion of steel, aluminum and other metals. Material is being manufactured under an exclusive license agreement with a large European chemical firm. Material has been used extensively for the past 10 years in Europe, Asia and Africa, and has achieved phenomenal results. Interested parties should presently be contacting chemical plants, shipyards, construction companies, highway departments, fabricators, etc. Include all particulars first letter.

Box 725, STEEL
Penton Bldg., Cleveland 13, Ohio

CLASSIFIED

Representatives Wanted

SALES REPRESENTATIVES

Salesmen currently selling joists, grating, or other allied products to the structural steel fabricators in Western Pennsylvania, Eastern Ohio, West Virginia and Eastern Seacoast States south of Virginia. Salesmen must be able to make take-offs from structural and architectural blueprints. In first reply please list items carried and exact territory covered. We are a specialty manufacturer selling the structural steel fabricators. Reply Box No. 721, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

SALESMAN, Age 28, College, metallurgical background, five years experience metals industry, excellent contacts East Coast aircraft plants and original equipment manufacturers, seeks employment as eastern sales representative. Reply Box 724, STEEL, Penton Bldg., Cleveland 13, Ohio.

STEEL FABRICATION

Engineer-Estimator-Production Manager-Superintendent. Graduate Engineer—25 years in Steel Fabrication. Buildings-Bridges-Platework-Riveted and Welded construction—wishes responsible position with progressive company. Reply Box 726, STEEL, Penton Building, Cleveland 13, Ohio.

STEEL EXECUTIVE, 34, College degree, 8 years experience in sales and management with mill and warehouse. Five figure salary. Reply Box 723, STEEL, Penton Bldg., Cleveland 13, Ohio.

ton area are involved in the sale of imported steel products. A vast majority of them would rather not handle foreign steel, but competition from importers has forced most of the distributors into that line.

Structural Shapes . . .

Structural Shape Prices, Page 98

With considerable work on drawing boards, structural steel fabricators anticipate an early upturn in demand. They think active inquiry will be noticeably heavier by February, the uptrend accelerating throughout the first half of the year as buyers start hedging against shortages that might result in event of a midyear steel strike.

Public work dominates the market outlook, but a fairly sizable volume of commercial projects is under consideration. The highway program will provide a strong demand for steel, especially when weather conditions permit construction to go ahead.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1947 tons, state bridge, Cumberland County, Pennsylvania, through Hempt Bros., Camp Hill, Pa., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

900 tons, senior high school, Pottstown, Pa., through F. K. Campion, Philadelphia, general contractor, to Frank M. Weaver & Co., Lansdale, Pa.; also, 260 tons of joists went to John W. Hancock, Roanoke, Va.

575 tons, six highway bridges, Longmeadow, Mass., to Haarmann Steel Co., Holyoke, Mass.; Daniel O'Connell's Sons Co. Inc., Holyoke, general contractor.

400 tons, state highway bridge, Portland-Falmouth, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; A. H. Hinman, North Anson, Maine, is general contractor; bridge subcontracted to Seaboard Engineering Corp., Portland, Maine.

300 tons, state highway bridge, Blue Hill Ave., Mattapan District, Boston, to Builders Iron Works, Somerville, Mass.; 90 tons of reinforcing bars pending.

295 tons, research building, University of Washington, to Isaacson Iron Works, Seattle; Clark Construction Co., Seattle, has the general award at $388,783.

278 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Oregon Steel Mills, Portland, Oreg., $48,663.

220 tons, addition, Lincoln High School, Seattle, to Isaacson Iron Works, Seattle; Lease Co., Seattle, general contractor.

208 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Melton Steel Co., Inc., Westbury, N. Y., $34,026.

180 tons, state highway bridge, interstate route over Main St., Waterville, Maine, to Bethlehem Steel Co., Bethlehem, Pa.; Callahan Bros. Inc., Mechanics Falls, Maine, general contractor; also 70 tons, reinforcing bars, Bancroft & Martin Rolling Mills Co., South Portland, Maine.

170 tons, dry kiln for Seattle Cedar Lumber Mfg. Co., to Isaacson Iron Works, Seattle.

135 tons, structurals and bars, two state bridges, Lakeville, Mass., to United Structural Steel Co., Worcester (60 tons, structurals), and Bethlehem Steel Co., Bethlehem, Pa. (75 tons, reinforcing); Bayer & Mingolla Construction Co. Inc., Worcester, Mass., general contractor.

135 tons, warehouse and laboratory, Morning Star Paisley Inc., Clifton, N. J., to Bergen Point Iron Works, Bayonne, N. J.

130 tons, state bridgework, Suffolk County, New York, to the Pine Brook Iron Works, Scranton, Pa.

110 tons, pipe bridge, Seattle's Tolt River water supply line, to Bethlehem Pacific Coast Steel Corp., Seattle; Willar Construction Co., Seattle, general contractor, low at $91,130.

100 tons, structurals and bars, three single rolled beam bridges, Washington, Conn., to McDermott Steel Specialties Co., New Haven, Conn., and Scherer Steel Co., Hartford, Conn. (reinforcing); Oneglia & Gervasini Inc., Torrington, Conn., general contractor.

100 tons, junior high school, Juneau, Alaska, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

1100 tons, seven-span welded girder bridge, Merrimack River, Bedford-Manchester, N. H.; Monroe-Langstroth Co., Norwood, Mass., low on the general contract; also, 430 tons of reinforcing bars, and 230 tons of steel piles.

190 tons, junior high school, Sunnyside, Wash.; general contract to Yeaman Construction Co., Yakima, Wash.

165 tons, grade M, General Stores Supply Office, Navy, Philadelphia.

135 tons, state highway bridge, Lisbon, N. H.; bids in.

120 tons, Swedish Club, Seattle; Turnquist Construction Co., Seattle, low bidder.

100 tons, trash racks and hoist, Rocky Reach Dam; Monarch Forge & Machine Works, Portland, Oreg., is low at $21,751 to the Chelan P.U.D. No. 1, Wenatchee, Wash.

REINFORCING BARS . . .

REINFORCING BARS PLACED

660 tons, state highway bridges, Thomaston-Litchfield-Harwinton, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; W. J. Megin Inc., Naugatuck, Conn., general contractor; 245 tons, steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, six state highway structures, Longmeadow, Mass., to Scherer Steel Co., East Hartford, Conn.; Daniel O'Connell's Sons Co. Inc., Holyoke, Mass., general contractor.

350 tons, seven highway structures, Snake River, Idaho, to an unnamed fabricator; general contract to Lonnie Smith, Twin Falls, Idaho, low at $521,601.

200 tons, engineering building, University of Washington, Seattle, to Joseph T. Ryerson & Son Inc., Seattle; Wick Construction Co., Seattle, general contractor.

180 tons, administration building, University of Washington, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Wick Construction Co., Seattle, general contractor.

150 tons, high school, Juneau, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Warrack Construction Co., Seattle, general contractor.

140 tons, addition to Lincoln High School, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Lease Co. is general contractor.

130 tons, state highway bridge, interstate route over the Maine Central Railroad and County Road, Waterville, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Callahan Bros., Mechanics Falls, Maine, general contractor.

105 tons, state highway bridge, Oakland-Waterville, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Seaboard Engineering Co. Inc., Portland, Maine, general contractor.

REINFORCING BARS PENDING

1200 tons, warehouse, Everett, Wash., bids in.

140 tons, engineering building, University of Washington; general award to Wick Construction Co., Seattle, low at $813,954.

PLATES . . .

PLATES PLACED

1498 tons, carbon steel hull plates, two contracts, General Stores Supply Office, Navy, Philadelphia, to C. Itoh & Co. (American) Inc., New York.

535 tons, high tensile, grade Hy-80, Navy Purchasing Office, Washington, to Lukens Steel Co., Coatesville, Pa., $284,329.

485 tons, high tensile hull plates, naval shipyard, Bremerton, Wash., to Bethlehem Pacific Coast Steel Corp., $102,908.

400 tons, one water and two oil storage tanks, Consolidated Edison Co., Buchanan, N. Y., to the Graver Tank & Mfg. Co., East Chicago, Ill.

PLATES PENDING

590 tons, Hy-grade, dimpled, Navy Purchasing Office, Washington.

115 tons, floor plates, General Stores Supply Office, Navy, Philadelphia; bids to be taken Jan. 19.

105 tons, carbon, General Stores Supply Office, Navy, Philadelphia; bids Jan. 13.

100 tons, for 9900 ft of 36 in. welded steel water pipe, Portland, Oreg.; Salem Sand & Gravel Co., Portland, is low bidder at $281,462.

100 tons, including shapes, steel barge for Port of Bellingham, Wash.; bids Jan. 13.

60 tons, 150,000 gal water tank for Bremerton, Wash.; Graver Tank & Mfg. Co., Chicago, apparently low bidder at $42,774.

PIPE . . .

CAST IRON PIPE PENDING

610 tons, bids in to Alderwood Manor, Wash.

287 tons, bids in to Bellingham, Wash.

233 tons, 4 to 20 in., Puget Sound drydock for the Navy; bids in.

170 tons, bids in to Sunnyside, Wash.

Unstated, 42,000 ft of 4 to 16 in.; bids in to Seattle, Jan. 7.

Unstated, bids in to Pomeroy, Wash., for 10 in. mains.

STEEL PIPE PLACED

1500 tons, 36 and 48 in. steel pipe, waterlines, Weston - Newton - Wellesley and Needham, Mass., Metropolitan District Commission, Boston, to Bethlehem Steel Co., Bethlehem, Pa.; Wes Julian Construction Co., Dedham, Mass., general contractor.

100 tons, 6 in. ID, welded, U. S. Engineer, Chicago, to Acme-Newport Steel Co., Newport, Ky.

STEEL PIPE PENDING

Unstated, two welded steel oil pipelines, 11,500 ft long; bids to Port of Vancouver, Wash., Jan. 16.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Duluth, Messabi & Iron Range, sixteen 1750-hp locomotives, to the Electro-Motive Div., General Motors Corp., La Grange, Ill., and six 2400-hp switchers to Alco Products, New York.

RAILROAD CARS PLACED

Delaware & Hudson, 10 cabooses, placed.

Soo Line, 50 gondolas, 100 boxcars, 25 flatcars, and 25 covered hoppercars, to its own shops at North Fond Du Lac, Minn., for construction in 1959.

Union Tank Car Corp., 57 tankcars, to its Whiting, Ind., shops.

Union Pacific, 200 piggyback flatcars, 100 going to the American Car & Foundry Div., ACF Industries Inc., New York, and 100 to the Pullman-Standard Car Mfg. Co., Chicago.

Canadian National, 12 hoppercars, to Canadian Car Co., Montreal, Canada; these are in addition to 20 previously placed.

Atlantic Coast Line, 200 hoppercars to its Way Cross, Ga., shops.
Waycross, Ga., shops.

Chicago, Rock Island & Pacific, 500 boxcars, to St. Louis shops of the American Car & Foundry Div., ACF Industries Inc., New York.

Minneapolis, St. Paul & Sault Ste. Marie, will build 2000 freight cars in its own shop at North Fond Du Lac, Minn., during 1959. Costing $1.7 million, the program will add 100 boxcars, 50 gondolas, 25 flatcars, and 25 covered hoppers. Operations will begin in the second quarter next year.

HOW ABOUT YOU?

Do you know that many cancers can be cured if detected early? That an annual health checkup is your best protection against cancer?

Are you giving yourself this big advantage? Or are you taking chances with your life because of foolish attitudes about cancer like these?

DON'T EVEN MENTION THAT WORD!

Fear keeps some people from even *learning* cancer facts that can save their lives.

NEVER FELT BETTER!

Checkups help to detect cancer in its "silent" stage before you notice any symptom.

COSTS TOO MUCH!

Dollars you spend for the protection of your health can mean years of life.

Millions of Americans have made an annual checkup a habit... *for life.* How about you?

AMERICAN CANCER SOCIETY

Advertising Index

Amchem Products, Inc. 50
American Welding & Manufacturing Co., The 24
Aronson Machine Co. 16

Bethlehem Steel Co. 1
Bliss & Laughlin 32
Bliss, E. W., Co. 63
Bristol Brass Corporation, The 64

Campbell Chain Co. 86
Carpenter Steel Co., The 94, 95
Chase Brass & Copper Co. 105
Cincinnati Milling Machine Co., The, Special Machine Division 43
Colorado Fuel & Iron Corporation, The 17
Copper & Brass Research Association 20, 21
Copperweld Steel Co., Aristoloy Steel Division 53

Detroit Steel Corporation 30

Electric Controller & Mfg. Co., The, A Division of The Square D Co. 46, 47
Erie Foundry Co. 7
Esso Standard Oil Co. 61

Great Lakes Steel Corporation 14, 15

Heald Machine Co., The ..... Inside Front Cover
Hough, Frank G., Co., The 12

Jones & Laughlin Steel Corporation 54
Jones & Laughlin Steel Corporation, Stainless & Strip Division 90

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 83
Kaiser Engineers, Division of Henry J. Kaiser Co. ..... Inside Back Cover
Keystone Lamp Mfg. Corporation 113
Kingsbury Machine Tool Corporation 44

Lamson & Sessions 2, 3
LeBlond, R. K., Machine Tool Co., The 4
Lilly, Eli, & Co., Agricultural & Industrial Products Division 58

Magnethermic Corporation 13
Marchant, Geo. F., Co. 107
Monarch Machine Tool Co., The 18, 19

National Steel Corporation 14, 15

Pannier Corporation, The 106
Partlow Corporation, The 109
Pittsburgh Crushed Steel Co. 57
Pittsburgh Steel Co. 22, 23

Republic Steel Corporation 8, 9
Rockford Machine Tool Co. 80, 81
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 17
Ryerson, Joseph T., & Son, Inc. 29

Selas Corporation of America 66, 67
Sintercast Corporation of America 10
Sonken-Galamba Corporation 113
Square D Co., The, The Electric Controller & Mfg. Co. Division 46, 47

Texas Co., The 68
Timken Roller Bearing Co., The ..... Back Cover

United States Rubber Co., Mechanical Goods Division 77
Universal-Cyclops Steel Corporation 111

Virginia Electric & Power Co. 116

Yale & Towne Manufacturing Co., The, Yale Materials Handling Division 11
Yoder Co., The 6

Table of Contents, Page 5

Classified Advertising, Page 113

TO FIND THE MAN YOU NEED...

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

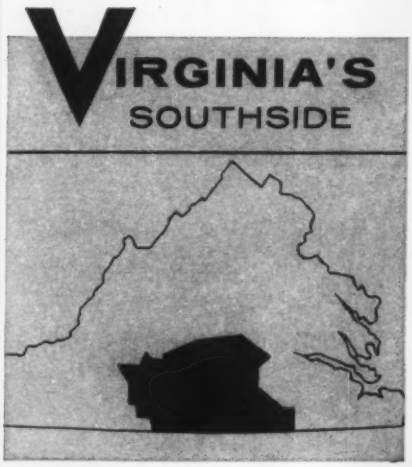
STEEL The Metalworking Weekly

Our trees grow faster than our new plant can use them!

Furniture, wood pulp and lumber manufacturing have all grown fast in Southside Virginia. Yet in many parts of the area, tree growth still outstrips tree use. For in this favorable climate and soil, hard and soft woods mature from 50% to 100% faster than further north.

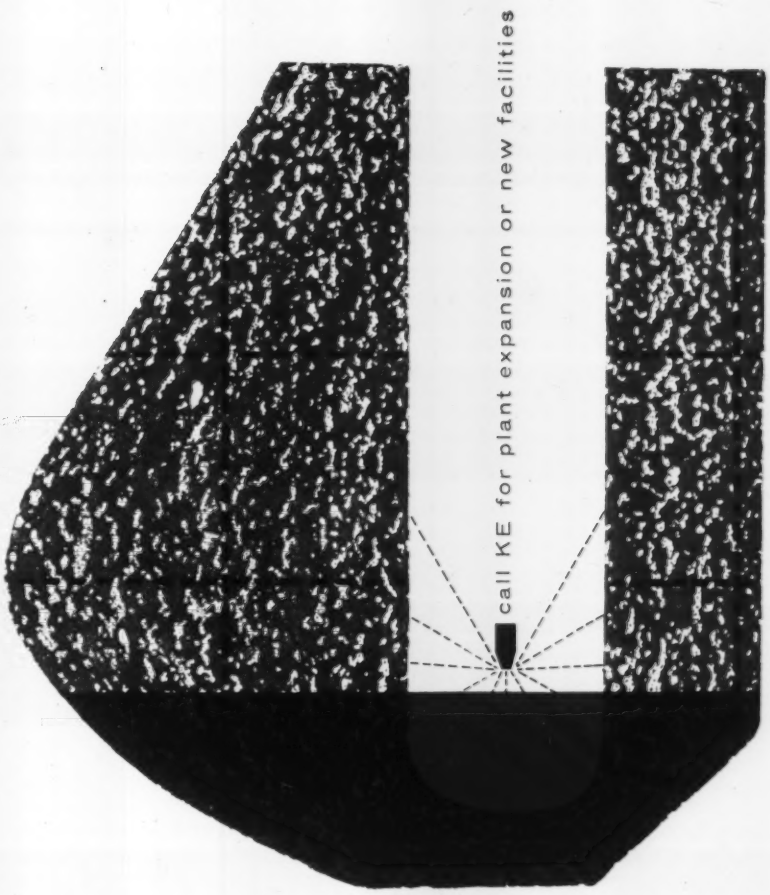
Another growing resource for your plant in Southside Virginia is the abundant electric power supplied by Vepco's modern, interconnected network. Over 1,700,000 kilowatts of generating capability now . . . due to exceed 2,000,000 kilowatts by 1961.

Interested? Ask Vepco for more facts and confidential site-finding help in this land of mild climate and pleasant living . . . where you get Southern advantages within overnight range of top Northeast and Mid-west markets.



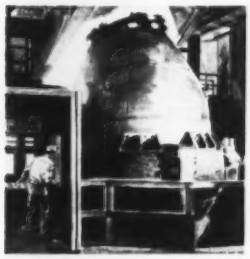
50TH YEAR 50 1909-1959

Write or phone, Clark P. Spellman, Manager—Area Development
VIRGINIA ELECTRIC and POWER COMPANY
Electric Building, Richmond 9, Virginia • MIlton 9-1411



INGENUITY

has made KE the experienced leader in L-D Process Steel



L-D process plant similar to that installed by KE at a major eastern steel plant.

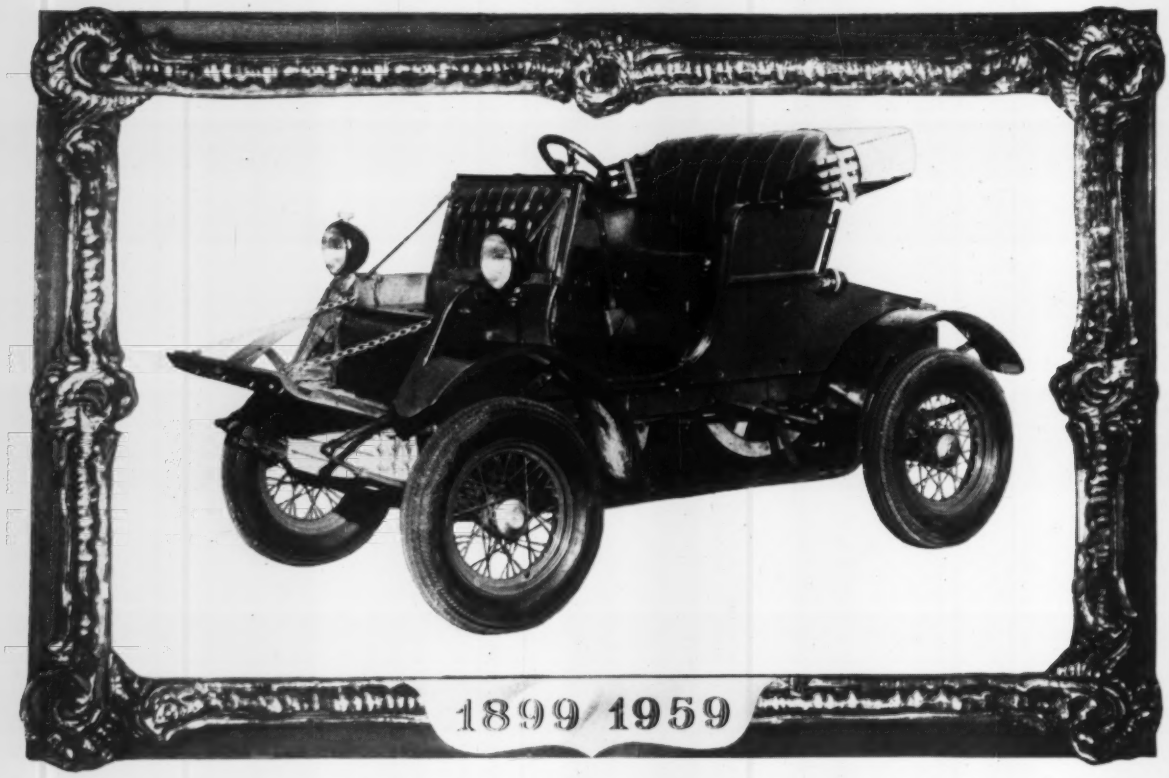
Design and construction of over 2,000,000 tons of oxygen steel making capacity. Intimate familiarity with oxygen steel technology in all parts of the world. A pioneer's experience in applying tested techniques of steel making. U.S. licensor for the proven L-D process—also P.T. Oxygen Guns for present and planned open hearths.

These are reasons why Kaiser Engineers is uniquely qualified to develop your oxygen steel program. Another reason is traditional KE ingenuity—engineering and construction ingenuity which means your steel facilities will be completed more quickly, at lower cost, and operate more efficiently.

Economic analysis, plant location, engineering, design, procurement, expediting, construction—KE does one or all. With your first thought of new steel producing facilities—call KE.

KAISER ENGINEERS engineers—contractors
Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Rio de Janeiro, Sydney, Tokyo



Everything's changed but the trademark on the bearings

BUILT by the St. Louis Motor Car Co. in 1899, this car was the first equipped with Timken® tapered roller bearings. It's still running. And today every make of American car but one uses Timken bearings. The things that the trademark "Timken" stands for haven't changed. It still means the highest quality, the best-known name in bearings, and the kind of service you can't get anywhere else. It means better performance with longer life and less maintenance in machine tools, steel mills, heavy construction machinery, farm implements and tractors—wherever wheels and shafts turn.

"Timken" is a registered trademark that identifies all products of The Timken Roller Bearing Company—tapered roller bearings, fine alloy steel bars, seamless steel tubing and removable rock bits.

It's to your advantage to remember that "Timken" is not a type of product. It's your assurance of the best in tapered roller bearings, fine alloy steels and removable rock bits. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".

TAPERED ROLLER BEARINGS • REMOVABLE ROCK BITS • FINE ALLOY STEEL

TIMKEN®

first in quality for 60 years